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ABSTRACT

This learning activity packet (LAP) contains 11 self-paced study lessons that allow students to proceed along a 36-hour course of study for Lotus 1-2-3 at their own pace. The lessons are organized in the following way: objectives, completion and performance standards, a list of required materials, unit test, and exercises (applications of the operations to measure the laboratory competency of the student in regard to the materials presented in the LAP). Most lessons are presented in a "read and do" format. The lessons are: getting started with Lotus 1-2-3; moving around the worksheet; typing cell entries; using 1-2-3 commands; indicating cell ranges; building a simple worksheet; building a simple database; building a simple graph; writing formulas; 1-2-3 functions; and formatting a worksheet. Supplemental worksheet exercises, unit tests for each lesson, and answer keys for the tests and all exercises are appended. These lessons have been prepared for use with the IBM Personal Computer. (YLB)

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LEARNING ACTIVITY PACKETS



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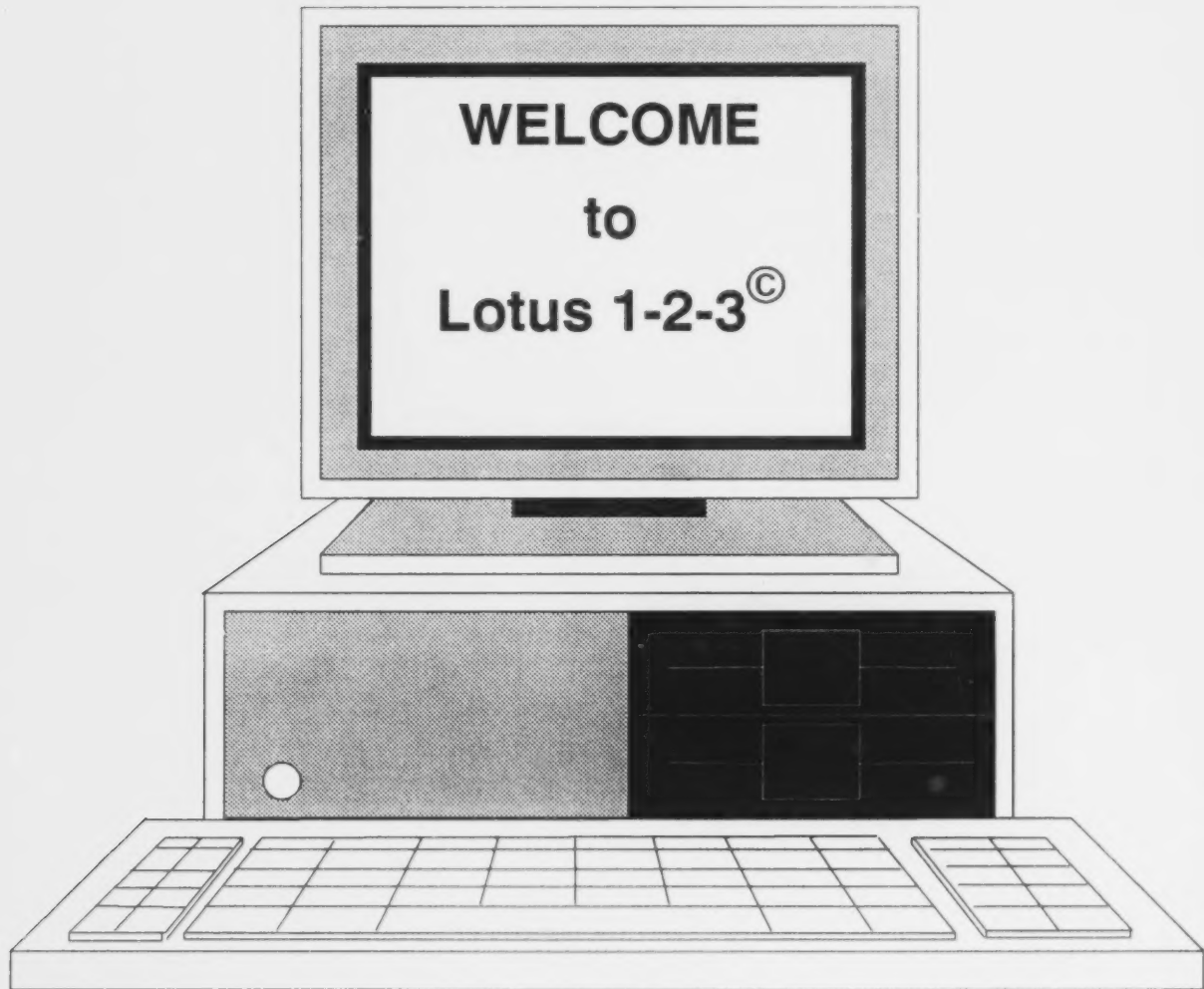
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A special thanks goes to the Business and Office instructors who participated in the training workshops and helped validate and refine the LAPs.

PREFACE

WHAT ARE LAPS?

Learning Activity Packets (LAPs) are self-paced study lessons that allow the student to proceed along a course of study at his or her own pace. The student is allowed to progress to the next lesson in the unit only after a certain level of competency and understanding is achieved.

The advantage to the student of using LAPs for certain areas of study is obvious in that it allows the student to progress at his or her own pace. Some students learn faster than others and LAPs takes this fact into consideration by allowing all to learn at their own rate.

The advantage to the instructor of using LAPs for certain areas of study is that the instructor becomes available to be your lab partner. This allows more individual attention to each student's learning needs.

ORGANIZATION OF LESSONS

The lessons used in the LAPs are organized in the following way:

LESSON NAME	This is the name of the LAP within the instructional unit.
LESSON NO.	Each lesson is numbered to maintain the right sequence of instruction.
OBJECTIVES	A description of the major points or concepts which will be taught in a lesson as well as a description of what the student should be able to perform upon completion of the unit.
COMPLETION STANDARD	This is a suggested maximum amount of time the student will need in order to complete the lesson. This information is available in the Teachers Manual and Index.
PERFORMANCE STANDARD	This score must be achieved on the Unit Test and Exercises before progressing to the next unit. These LAPs will always use a standard of 70% for each lesson.
REQUIRED MATERIALS	This is a list of all materials the student will need in order to complete the lesson.

UNIT TEST	The Unit Test is used to measure the theory competency of the student in regard to the material presented in the LAP.
EXERCISES	An application of the operations is assigned to measure the laboratory competency of the student in regard to the material presented in the LAP.

READ AND DO

Most lessons are presented in a READ and DO format. Some information is presented in a READ paragraph. A response to the information just presented is made in the form of a DO paragraph. However, sometimes information is presented with no requisite DO responses.

COMPUTER HARDWARE CONFIGURATION

These lessons have been prepared for use with the IBM Personal Computer. Since the computer you use may be equipped differently from other IBM-PC's, you should take note as to the configuration of your computer. Many instructions may refer to a particular disk configuration or a particular kind of printer. You should be aware of the particular configuration for the microcomputer you are using.

SOFTWARE VERSION

The information presented in the lessons generally reflect the latest version of the software currently available on the consumer market.

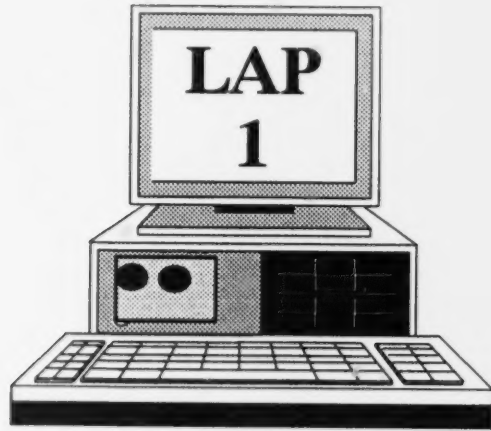
LEARNING PROCEDURES

This is the step-by-step procedure the student should follow in order to complete the lesson properly. Generally, the learning procedure for each lesson should follow this schedule:

1. READ the Objectives for the lesson. Be certain that you have selected the correct lesson and have the required materials.
2. READ and DO the information and operations presented in the lesson.
3. DO the Exercises at the end of the lesson and return to the instructor for scoring.
4. STUDY the information presented in the lesson.
5. DO the Unit Test and return to the instructor for scoring.
6. If you meet the performance standard, MOVE to the next lesson in the sequence.

**LOTUS 1-2-3
Beginning Course**

NO.	LESSON NAME	PRE REQ.	COMPLETE. STANDARD
01	Getting Started with Lotus 1-2-3	None	1 hr.
02	Moving Around the Worksheet	01	1 hr.
03	Typing Cell Entries	02	2 hrs.
04	Using 1-2-3 Commands	03	1 hr.
05	Indicating Cell Ranges	04	1 hr.
06	Building a Simple Worksheet	05	3 hrs.
07	Building a Simple Database	06	3 hrs.
08	Building a Simple Graph	07	3 hrs.
09	Writing Formulas	08	3 hrs.
10	1-2-3 Functions	09	6 hrs.
11	Formatting a Worksheet	10	3 hrs.
	Supplemental Worksheet Exercises	11	9 hrs.
TOTAL TRAINING TIME FOR COURSE			36 hrs.



LESSON 1

GETTING STARTED WITH LOTUS 1-2-3

OBJECTIVES:

- * Discuss the beginning and subsequent development of electronic spreadsheet programs
- * Explain what an electronic spreadsheet is and how it is used
- * Explain the Lotus 1-2-3 Start-Up Procedure
- * Describe the Lotus Access System

REQUIRED MATERIALS:

- * Paper and pen or pencil
- * A DOS diskette
- * Lotus 1-2-3 System Disk
- * A practice disk
- * IBM-PC with 1 or 2 diskette drives or hard disk and printer

READ: HISTORY OF ELECTRONIC SPREADSHEET PROGRAMS

Being a good manager requires the ability to work with a lot of numbers accurately and quickly. Managers estimate projected sales and expenses, analyze production costs, calculate the effects on profits from price changes, determine the best investment strategies for securities portfolios, and prepare budgets--just to mention a few tasks that require substantial calculations.

It might sound to you as if managers spend a lot of time doing financial analysis. They do although they are often required to do calculations for a lot of other purposes, too. Moreover, managers also require their support staffs to do the calculations--it's often called number crunching--so that the manager can focus on the decisions to be made without spending a lot of time doing the arithmetic.

Before 1980, most of those kinds of calculations were done by hand. Using a columnar tablet, a hand calculator and a pencil, managers would construct profit projections, cash flow analyses, and other financial models. A mistake meant recalculating all the figures which were based upon the erroneous value. Changing the analysis to accommodate possible events, such as increases in prices or reductions in interest rates, meant reconstructing the whole table, called a **spreadsheet** or **worksheet**, from scratch. In short, more time was spent doing and redoing arithmetic than in analyzing and interpreting the results. The tools of the trade included the pad, the calculator, several pencils and, of course, a good eraser.

In 1979, Dan Bricklin, a graduate student at Harvard Business School, joined forces with Robert Frankston, a computer programmer, to prepare a computer program which would take care of the tedium of worksheet analysis. Their work resulted in a program called VisiCalc(1), short for "Visible Calculator." It was visible because the results of the computer's calculations appeared on a computer's video display screen as if it were a sheet of columnar paper.

About the same time, Steven Jobs and Stephen Wozniak began production of their Apple II computer in a garage in Cupertino, California. Bricklin and Frankston modified their VisiCalc program to run on the new computer, which came with an effective operating system and could be equipped with disk drives for data storage.

Hundreds of thousands of the VisiCalc-Apple II systems were sold. Indeed, some industry observers credit this combination as the primary moving force behind the microcomputer revolution. Since the Apple-VisiCalc alliance, many other software producers have introduced worksheet programs, each trying to out-do the others in power and flexibility. Today, there are dozens of worksheet programs available, not only for microcomputers but for mini- and mainframe computers, too.

One of these, developed by Mitchell Kapor, founder of Lotus Development Corporation, is called 1-2-3. Marketed by Lotus Development Corporation, 1-2-3 is now the world's most popular electronic spreadsheet for the IBM Personal Computer.

Almost everybody in modern society is a financial manager. The sole proprietor is a financial manager and every other kind of manager, too. So is the homeowner. So, too, are the apartment dweller, the college student, and the military professional. One does not have to be a financial manager to make good use of a spreadsheet program, but a financial manager today would be lost without one.

READ: WHAT IS AN ELECTRONIC SPREADSHEET

One of the primary characteristics of an electronic spreadsheet or worksheet program is its simplicity. Think of the worksheet program as a sheet of paper. It would be easier to use the sheet of paper if it were ruled into rows and columns. Rows stretch across the paper horizontally--columns divide the paper vertically. It is just the kind of paper we can buy in pads from an office supply store. The intersection of a row and a column is called a cell. In order to use the worksheet you enter information into the various cells, trying to organize the cells so that they will be easy to interpret when finished.

You use an electronic worksheet just like its paper counterpart. You enter values into cells and it performs calculations. The results of the calculations also appear in cells. If you understand how to do this kind of work on paper, it's easy to learn how to do it on a computer.

The differences between paper worksheets and electronic ones are many. These differences make the electronic variety much easier to use. They also make spreadsheet analysis much more powerful than when done on paper.

READ: WORKSHEET CAPACITY

Columnar tablets have as many as fifty rows and a dozen or so columns. There's no reason why you can't paste many of these together to make up a worksheet as large as needed. It might be easier to buy a roll of butcher paper. If ruled into 64 columns and 256 rows, it would be about the size of the smallest electronic worksheet, the original VisiCalc. Many electronic worksheets today are limited to that size and, indeed, having 16,384 cells may seem large enough to handle many applications.

Others are much larger, challenging even the most dedicated user of butcher paper. SuperCalc3(2) sets up a worksheet with 9,999 rows and 127 columns. 1-2-3, so named because, according to Lotus, "it is as easy to use as 1-2-3," offers a worksheet that is 256 columns and 2,048 rows in Release 1A and 8,192 rows in Release 2. These limits may be reduced by the size of the computer's memory.

It's easy to see that electronic spreadsheets offer more working space than even the largest sheet of paper can reasonably accommodate. Still, it helps to think about an electronic spreadsheet as a program that converts the memory into a giant sheet of paper organized into columns and rows.

READ: VIEWING THE WORKSHEET

1-2-3 and other spreadsheet programs turn your computer's memory into a giant "worksheet." The worksheet, similar to a financial ledger sheet, is ruled into rows and columns. That's just the way worksheet programs use the display screen. You can scroll the screen right, left, up and down to view any part of the worksheet. On initial startup of a worksheet program, the screen is positioned in the upper left-hand corner of the sheet.

THE LOTUS WORKSHEET

B2:

	A	B	C	D	E	F	G	H
1								
2		[	]					
3								
4								
5								
6								
7								
8								
9								
10								

All spreadsheets operate in essentially the same fashion. In the case of 1-2-3, the columns are identified by letters of the alphabet and the rows by numbers. The cell identifier or the cell address of any cell consists of letter (or letters) and a number. The cell in the upper left-hand corner, for example, carries the identifier A1. The cell in the 27th column and the 15th row is identified by AA15 and the cell in the 53rd column and the 15th row is identified by BA15. After exhausting the twenty-six letters of the alphabet, 1-2-3 adds a second letter and continues, beginning with a new letter every twenty-six letters.

Ordinarily, the pointer on an empty spreadsheet appears in the left-most cell when the program first starts. This pointer is a highlighted rectangle indicating the point at which data is to be entered or identifying some function to be performed. The cell on which the pointer rests is known as the active or selected cell. For 1-2-3, the pointer appears as a highlighted rectangle.

GETTING STARTED WITH LOTUS 1-4

You can scroll by using the arrow keys to move the pointer toward the desired cell. When the pointer reaches the edge of the screen, the worksheet begins to move, bringing other rows or columns into view. In effect, you slide the window across, up, or down the worksheet to see other parts of it. The part of the worksheet that is displayed on the screen at any given moment is the worksheet window.

READ: THE LOTUS ACCESS SYSTEM

As powerful as it is, 1-2-3 can't do the whole job alone. So, to keep things running smoothly for you, a number of additional programs are included on your disks--some provided by Lotus and others installed by you.

Lotus has gathered the essential programs needed to support 1-2-3 usage under a single, easy-to-use umbrella called the LOTUS ACCESS SYSTEM.

The Access System is like 1-2-3 itself in several ways:

- * You select tasks to perform from a series of menus that both present all your options and provide a short explanation of each one.
- * Every step of the way, you can press the F1 [Help] key to get more detailed explanations.
- * Procedures that erase data are protected with confirmation steps, to minimize the likelihood of accidentally doing something you'll later regret.

READ: THE LOTUS START-UP PROCEDURE

There are several ways that your Lotus 1-2-3 program may start. These are dependent on several factors including your computer configuration, your diskette drive capacity, and the version of 1-2-3 that you are using.

Your instructor or lab assistant will notify you as to which of the following Start-Up Procedures is appropriate for your computer and software configuration.

DO: LOTUS START-UP PROCEDURE (AUTOMATIC START)

1. If you have not turned on the computer, place the Lotus System Disk in Drive A and a practice disk in Drive B.

2. Power on the computer. When you turn the computer on with the 1-2-3 System Disk or Backup Disk in Drive A (on the left), the computer automatically passes control to the Access System. First, though, it prompts you to enter the current date and time.
3. Enter the Date and Time.

The Access System Menu screen appears.

DO: LOTUS START-UP PROCEDURE USING FLOPPY DISKS SYSTEM

Use this procedure for starting Release 2 of Lotus 1-2-3 using a computer with 2 floppy disks. You need the Lotus System Disk and a DOS disk:

1. Place a DOS disk in Drive A and your practice disk in Drive B.
2. Power on the computer.
3. Enter the Date and Time.
4. Remove the DOS disk in Drive A and replace with the Lotus System Disk.
5. Type LOTUS to enter the Access System or 123 to go directly to the worksheet function and press <Return>.

The Access System Menu screen appears.

DO: LOTUS START-UP PROCEDURE USING A HARD DISK SYSTEM

Use this procedure for starting Release 2 of Lotus 1-2-3 using a computer with a hard disk.:

1. Power on the computer.
2. Enter the Date and Time.
3. Change the default directory to the Lotus sub-directory if necessary (ask your instructor or lab assistant).
4. Place the Lotus System Disk in Drive A if a bootable copy of 1-2-3 is not installed on your hard disk (ask your instructor or lab assistant).
5. Type LOTUS to enter the Access System or 123 to go directly to the worksheet function and press <Return>.

READ: NOTES ON THE LOTUS START-UP PROCEDURE

- A. If you are using a computer with a hard disk organizer or menu program, you should check with your instructor or lab assistant for the appropriate procedure for starting Lotus 1-2-3.
- B. Although, it is possible to bypass date and time entry, you should be conscientious about entering them each time the computer prompts you to do so. These entries allow DOS to "time-stamp" all the data you store. You'll quickly find that it is sometimes very important for you to know when files were created.
- C. Even after you start using the program you can get the computer to restart without turning the power off and on. Press [Ctrl], [Alt], and [Del] simultaneously. (The power-down/power-up method works, but you must leave the power off for a few seconds.)

READ: THE ACCESS SYSTEM SCREEN

The Access System menu provides a list of choices on the second line of the screen. A menu pointer highlights 1-2-3. Below this choice is the description for the highlighted menu item, Enter 1-2-3--Lotus Worksheet/Graphics/Database program.

DO: GETTING HELP

1. With the Access System Menu visible on the screen, press F1 [Help] key to interrupt the session and view one or more help screens. This Help facility works the same way in the 1-2-3 program, also. (For details, see the "Using The Help Facility" chapter in the Lotus Reference Manual.)
2. Read the Help Screen. Notice that the Help Screen will always be associated with the function that is currently selected.
3. Press [Esc] to return to the Access System Menu.

DO: END PROCESSING SESSION

You may now end the 1-2-3 processing session by removing the Lotus System Disk and your practice diskette from the diskette drives and powering off the computer.

EXERCISES

Using the information presented in the lesson, ANSWER the following questions:

- (1) What was the name of the first electronic spreadsheet program and with what computer was it used?

- (2) Describe the organization of an electronic spreadsheet:

- (3) What is the size in rows and columns of the 1-2-3 worksheet?

- (4) Define the following electronic spreadsheet terms:

a. Cell _____

b. Pointer _____

c. Active (Selected) Cell _____

d. Window _____

- (5) List the Lotus Start-Up Procedure for entering the Lotus Access System using a computer with floppy disks:

a. _____

b. _____

c. _____

d. _____

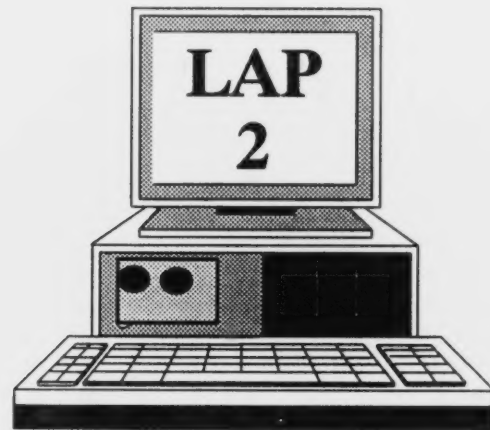
e. _____

- (6) List the Lotus Start-Up Procedure for entering the Lotus Access System using a computer with a hard disk:

a. _____
b. _____
c. _____
d. _____
e. _____

- (7) List the Lotus Start-Up Procedure for entering the Lotus Access System using a computer with a hard disk and a disk organizer or menu program (Optional):

a. _____
b. _____
c. _____
d. _____
e. _____



LESSON 2

MOVING AROUND THE WORKSHEET

OBJECTIVES:

- * Present the importance and reason for pointer movement around the worksheet
- * Explain the pointer movement one cell at a time
- * Explain the auto-repeat feature of the keyboard
- * Explain pointer movement directed to a specific location
- * Explain pointer movement a page at a time
- * Explain pointer movement by scrolling the worksheet window

REQUIRED MATERIALS:

- * Paper and pen or pencil
- * A DOS diskette
- * Lotus 1-2-3 System Disk
- * A practice disk
- * IBM-PC with 1 or 2 diskette drives or hard disk and printer

READ: MOVING AROUND THE WORKSHEET

The 1-2-3 worksheet is a collection of cells, organized into rows and columns. Each cell can store a single piece of information--number, formula, or label. The computer's display screen is a window into the worksheet. At any particular moment, you can see part of the worksheet, but not all of it.

A reverse-video bar, called the pointer, always highlights one of the cells in the window, indicating which cell is the active cell--the current focus of 1-2-3's attention. Using this bar--called the cell pointer--is probably the most important new skill to master in learning to use 1-2-3.

That's because you typically fill in the worksheet by repeatedly performing the following actions:

1. Move the cell pointer to a particular cell.
2. Type an entry or issue a command that affects the cell.

As so often happens, this procedure doesn't tell the whole story. Many 1-2-3 commands process an entire group of cells--called a range--all at once. For the time being we'll concentrate on the first step--mastering the art of pointing to a single cell.

DO: MOVING ONE CELL AT A TIME

To do this operation and the ones following, you need the 1-2-3 program loaded into computer memory. Follow the Lotus Start-Up Procedure select the 1-2-3 program.

You can use the arrow keys or the pointer-movement keys on the numeric keypad to move the cell pointer one cell at a time:

1. Using the <Right Arrow> key, move the pointer 5 cells to the right. The pointer should be located on cell, F1.
2. Using the <Down Arrow> key, move the pointer 5 cells downward. The pointer should be located on cell, F6.
3. Using the <Left Arrow> key, move the pointer 5 cells to the left. The pointer should be located on cell, A6.
4. Using the <Up Arrow> key, move the pointer 5 cells upward. The pointer should be located on cell, A1.

DO: AUTO-REPEAT

The keyboard's auto-repeat feature works nicely with these keys:

1. Hold down the <Right Arrow> key for a few seconds while the pointer moves repeatedly across the screen to the right.
2. Hold down the <Down Arrow> key for a few seconds while the pointer moves repeatedly down the screen.
3. Hold down the <Left Arrow> key for a few seconds while the pointer moves repeatedly across the screen to the left. If you move all the way back to the left-most column, the pointer will remain stationary and the computer will beep until you release the <Left Arrow> key.
4. Hold down the <Up Arrow> key for a few seconds while the pointer moves repeatedly up the screen. If you move all the way back to the top-most row, the pointer will remain stationary and the computer will beep until you release the <Up Arrow> key.

READ: NUMBER LOCK FACILITY

If you are using a keyboard that does not have separate pointer movement keys, be sure that the keyboard's number lock facility is turned off before you use the arrow keys. If the [Num Lock] key has been pressed, a NUM indicator appears in the lower right corner of the screen.

It is advisable that you leave the number lock off when using 1-2-3. The advantage of using the numeric keypad to enter numbers is greatly outweighed by the confusion caused when you forget that these keys won't move the cell pointer.

READ: EDGE OF THE WORKSHEET

Don't worry about the edges of the display screen. If you try to move the cell pointer off the worksheet, the program simply beeps at you to say "you can't do that." On the other hand, you can move the pointer downward "over the edge" if you're at row 20 or to the right "off the screen" if you're at column H.

If you move the pointer downward "over the edge," 1-2-3 automatically adjusts the window downward so that the cell pointer remains onscreen. If you move the pointer to the right "over the edge," 1-2-3 automatically adjusts the window to the right so that the cell pointer remains onscreen.

You can never make the cell pointer disappear--whenever the cell pointer moves in a way that would take it "over the edge," 1-2-3 automatically adjusts the window. In particular, when you make the pointer "push against the side of the window," the window moves.

It's also possible to do the opposite--move the window with the arrow keys, pulling the cell pointer along with it. This operation will be described later in this Unit.

DO: DIRECT TO THE DESTINATION

Moving one cell at a time is easy, but it's not the fastest way to move the cell pointer a long distance. You can move the cell pointer to any cell "in a single bound" just by pressing the F5 [GoTo] key and entering its location or address:

1. Press the F5 [GoTo] key.
2. On the prompt line at the top of the screen overstrike whatever cell location is displayed and type M30.

3. Press <Return>. Notice that the selected cell is "homed" to the upper left corner of the screen.

When your destination is offscreen, 1-2-3 automatically adjusts the window to place your destination cell in the upper left corner of the screen.

DO: THE HOME KEY

The [Home] key is actually a special type of [GoTo] operation. When you press this key, the cell pointer returns to the cell in the upper left corner of the worksheet. If necessary, 1-2-3 adjusts the window to include this cell. Typically, this is cell A1:

1. Press the F5 [GoTo] key, type Q77, and press <Return>.
2. Press the [Home] key. The pointer quickly moves to cell A1.

READ: MOVING THE WINDOW BY PAGES

You can think of the entire worksheet as being divided into screenfuls or pages. Typically, pages are twenty rows high and several columns wide. Just as the arrow keys allow you to move the pointer cell-by-cell, several other keys allow you to move the window around the worksheet page-by-page:

DO: THE [PgUp] AND [PgDn] KEYS

These keys move the window up or down one page. When you press one of these keys the cell pointer moves to the same relative position on the new page:

1. Press the [Home] key to move the pointer to cell A1.
2. Press the [PgDn] key one time. Notice that the pointer moved to the same relative position one page down, cell A21.
3. Press the [PgUp] key one time. Notice that the pointer moved to the same relative position one page up, cell A1.

DO: THE TAB [— |] AND [| —] KEYS

The <Tab> and <Back Tab> move the window one page to the left or right. The cell pointer moves to the same relative position on the new page:

1. Press the [Home] key to move the pointer to cell A1.
2. Press the [— |] key one time. Notice that the pointer moved to the same relative position one page to the right, cell I1.
3. Press the <Shift> and [| —] key one time. Notice that the pointer moved to the same relative position one page to the left, cell A1.

READ: KEY EQUIVALENTS

Holding down [Ctrl] and pressing the <Right Arrow> key is the same as [— |]. Holding down [Ctrl] and pressing <<Left Arrow>> is the same as [| —].

READ: THE SCROLL LOCK FACILITY

We saw above that when you move the cell pointer with the arrow keys, it sometimes pushes the window in the direction of movement. But sometimes you'll only want to move the window a bit without necessarily changing the position of the cell pointer. That's where the scroll lock facility comes in.

The [Scroll Lock] key is located in the extreme upper right corner of the keyboard, above the pointer-movement keypad. Pressing this key turns "on" the scroll lock facility. A SCROLL indicator appears in the lower right corner of the screen to confirm this. Pressing the key again turns scroll lock "off," erasing the indicator at the same time.

DO: SCROLL LOCK ON

The arrow keys move the window. When the pointer is at the edge of the window, moving the window "pulls" the cell pointer in the direction of movement:

1. Press the [Home] key to move the pointer to cell A1.
2. Press the [Scroll Lock] key one time. Notice that the SCROLL message is displayed in the lower right corner of the screen.
3. Press the <Right Arrow> key several times. Notice that the window scrolls to the right as the <Right Arrow> key is pressed.

4. Press the <Left Arrow> key several times. Notice that the window scrolls to the left as the <Left Arrow> key is pressed.
5. Press the [— |] key several times. Notice that the window scrolls to the right a page at a time as the [— |] key is pressed.
6. Hold down the <Shift> and press the [| —] key several times. Notice that the window scrolls to the left a page at a time as the [| —] is pressed.
7. Press the [PgDn] key several times. Notice that the window scrolls downward a page at a time as the [PgDn] key is pressed.
8. Press the [PgUp] key several times. Notice that the window scrolls upward a page at a time as the [PgUp] is pressed.
9. Press the [Scroll Lock] key one time. Notice that the SCROLL message is no longer displayed in the lower right corner of the screen.

DO: SCROLL LOCK OFF

When the pointer is at the edge of the window, moving the cell pointer "pushes" the window in the direction of movement.

1. Press the [Home] key to move the pointer to cell A1.
2. Be certain that the SCROLL message is not displayed in the lower right corner of the screen.
3. Press the <Right Arrow> key several times. Notice that the pointer moves to the right as the <Right Arrow> key is pressed.
4. Press the <Left Arrow> key several times. Notice that the pointer moves to the left as the <Left Arrow> key is pressed.

READ: ENHANCED KEYBOARDS

The [Num Lock] and [Scroll Lock] keys toggle these facilities of the numeric keypad on and off. When toggled off, the pointer movement keys are activated. When toggled on, the number keys are activated and the pointer movement keys are de-activated. Some newer keyboards have separate pointer movement keys and do not require the use of these facilities to activate the pointer movement function.

DO: END PROCESSING SESSION

You may now end the 1-2-3 processing session:

1. Press the / (slash) key.
2. Move the pointer to Quit and press <Return>.
3. Move the pointer to Yes and press <Return>.

You are now back to the Lotus Access System. You may remove the Lotus System Disk and your practice diskette from the diskette drives and power off the computer.

EXERCISES

Using the information presented in the module, ANSWER the following questions:

- (1) Which keys move the pointer one cell at a time and on what part of the keyboard are they located?

- (2) The keyboard feature which causes the cell pointer to move continuously in a specified direction while holding down a pointer movement key is called:

- (3) Which row and column are right and lower limits of the worksheet before any entries are made to it?

- (4) Define the pointer movement function for the following keys:

- a. <Right Arrow> _____
- b. <Left Arrow> _____
- c. <Up Arrow> _____
- d. <Down Arrow> _____
- e. [GoTo] _____
- f. [Home] _____
- g. [PgUp] _____
- h. [PgDn] _____
- i. [Scroll Lock] _____
- j. [Num Lock] _____

k. [— |] (Tab Right) _____

l. [| —] (Tab Left) _____

m. [Ctrl] <Right Arrow> _____

n. [Ctrl] <Left Arrow> _____

With the 1-2-3 program loaded into computer memory, DO the following operations and complete the question. (Each of the following operations begins with the pointer located in the home position, cell A1.):

OPERATION 1:

Move the pointer 5 cells to the right, 6 cells down, 2 cells to the right, 4 cells to the left, and 3 cells up.
What is the cell location of the pointer? _____

OPERATION 2:

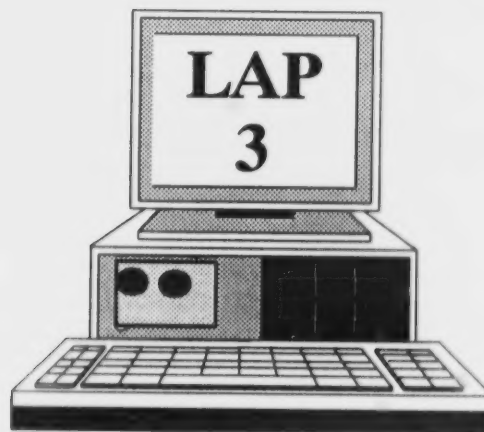
Move the pointer 1 page to the right, 1 page down, 2 pages to the right, 3 pages down, 2 pages to the left, and 2 pages up.
What is the cell location of the pointer? _____

OPERATION 3:

Scroll the screen 5 cells to the right, 6 cells down, 4 cells to the right, 2 cells up, and 1 cell to the left.
What is the cell location of the pointer? _____

OPERATION 4:

Move the pointer 1 page to the right, 2 pages down, 5 cells to the left, 6 cells up, and scroll one page to the right.
What is the cell location of the pointer? _____



LESSON 3
TYPING CELL ENTRIES

OBJECTIVES:

- * Explain the worksheet control panel
- * How to enter labels into the worksheet
- * How to enter numbers into the worksheet
- * How to enter formulas into the worksheet
- * Editing cell entries

REQUIRED MATERIALS:

- * Paper and pen or pencil
- * A DOS diskette
- * Lotus 1-2-3 System Disk
- * A practice disk
- * IBM-PC with 1 or 2 diskette drives or hard disk and printer

READ: TYPING CELL ENTRIES

When you start a 1-2-3 session, a 1-2-3 logo appears on the screen. Press any key to erase the logo. You are now looking at an empty worksheet. One of your main tasks is to fill in the cells with the numbers, formulas, and labels suitable to the application at hand.

There are three basic ways to make an entry into a cell:

1. Type it yourself.
2. Copy or Move an existing entry into another cell in the worksheet.
3. Retrieve data from a disk file--one created with 1-2-3 itself or one create with another program.

This Unit presents an in-depth discussion of the first method of entering information into a cell.

READ: THE CONTROL PANEL

The 1-2-3 control panel is the top three lines of the display. The first line contains information about the location of the cell pointer (active cell), the display format of the active cell, and the contents of the current cell.

The second line displays one of three things: (1) the characters of your entries as you type and edit them; (2) menu items; (3) prompts asking for additional command specifications.

The third line of the control panel is for "quick summaries" while you are selecting a command to perform from the command menu. As you move the menu pointer among the various command words before selecting one of them, 1-2-3 changes the third line so that its information always refers to the currently highlighted menu item.

B2: (F1) 1250 <--- Cell Address, Cell Format, Actual Cell Contents
<--- Characters being entered or edited
<--- Explanations of menu item highlighted by pointer

	A	B	C	D	E	F	G	H
1								
2		[	1250]	<---	the cell pointer			
3					B2 is the active cell			
4								
5								
6								

DO: TYPING ENTRIES

To do this Operation and the ones following, you need the 1-2-3 program loaded into computer memory. Follow the Lotus Start-Up Procedure and select the 1-2-3 program.

To type an entry into a particular cell, just move the cell pointer there and type the entry, ending with <<Return>>. As you type, you will notice that each letter appears on the second line of the control panel, above the worksheet:

1. Press the [Home] key to move the pointer to cell A1.
2. Type the word, **GRADE**, on the second line of the control panel. Be sure and press the [Caps Lock] key to type in all upper case. If the [Caps Lock] is activated the word, a CAPS indicator will be displayed in the lower right hand corner of the screen.

TYPING CELL ENTRIES 3-2

Notice that when you typed the first letter of the word, GRADE, a LABEL indicator appeared in the upper right hand corner of the screen.

As with many computer programs, a blinking cursor, the underscore character (_), indicates where the next character will appear. This may seem a bit unnecessary, but it is important. You'll need to move the cursor to make changes in the middle of an entry. (See "Edit Mode," below.)

3. To tell 1-2-3 that you're finished typing an entry, press <Return>. When you do so, 1-2-3 stores it in the current cell. If something already was stored in the cell, the new entry replaces it--there's no way to recover the old entry. (Moral: Look before you type!)

After you complete an entry, the second line of the control panel is cleared, and 1-2-3 displays the entry on the first line.

READ: LONG ENTRIES

A cell entry can be up to 240 characters long, quite a few more than 1-2-3 can display on the second line of the control panel. If you fill this line, the characters begin to scroll off to the left as you continue typing, allowing you to see the additional characters.

DO: USING THE POINTER MOVEMENT KEYS

Chances are that after you finish one entry, you'll want to move the pointer to another cell, perhaps to type another entry. To speed up this process a bit, you can finish an entry by pressing any of the keys that move the cell pointer, instead of pressing <Return>. This single keystroke has the effect of two: (1) it records the entry in the current cell, (2) it moves the pointer to another cell.

1. Move the pointer to cell A2.
2. Type the word, AVERAGE, on the second line of the control panel. Be sure and press the [Caps Lock] key to type in all upper case. If the [Caps Lock] is activated the word, a CAPS indicator will be displayed in the lower right hand corner of the screen.

Notice that when you typed the first letter of the word, AVERAGE, a LABEL indicator appeared in the upper right hand corner of the screen.

3. To tell 1-2-3 that you're finished typing an entry, move the cell pointer one downward. When you do so, 1-2-3 stores it in the current cell.

Your worksheet should look something like this:

A3:

	A	B	C	D	E	F	G	H
1	GRADE							
2	AVERAGE							
3	[		]					
4								
5								
6								
7								
8								

READ: COMPLETING A CELL ENTRY

When you complete a cell entry by pressing <Return> or a pointer-movement key, the following things happen:

- A. 1-2-3 checks the entry for errors. If the entry passes muster, 1-2-3 stores it in the current cell. If not, 1-2-3 beeps at you, places the cursor at the location of the problem, (or at the end if it isn't sure where the problem is) and switches to Edit Mode.
- B. If you have left 1-2-3 in its initial Recalculation setting of Automatic, 1-2-3 recalculates every formula in the worksheet.
- C. 1-2-3 updates the display screen, incorporating the new entry, its effect upon the rest of the worksheet, and the results of the pointer-movement key (if you pressed one).
- D. 1-2-3 returns the Ready Mode displaying the READY indicator in the upper right corner of the screen.

READ: ENTERING NUMBERS AND FORMULAS

There are three types of entries you can create: numbers, formulas, and labels. How can 1-2-3 tell which type you're entering? Simple--by making an educated guess using the first character of an entry.

If you start an entry with one of these characters, 1-2-3 thinks that you're entering a number or formula:

0 1 2 3 4 5 6 7 8 9 + - . (@ # \$

It is easy to see why 1-2-3 would assume that you're making a numeric entry with the first few of these characters. They are the basic building blocks of numbers and simple arithmetic expressions. The characters @ and # are used to form more sophisticated formulas.

DO: ENTERING NUMBERS

1-2-3 announces its decision after you type the first character by changing the READY indicator in the upper right corner to VALUE:

1. Move the pointer to cell A3.
2. Type the number, 98, on the second line of the control panel.

Notice that when you typed the first digit of the number, 98, a VALUE indicator appeared in the upper right hand corner of the screen.

3. To tell 1-2-3 that you're finished typing an entry, move the cell pointer down one cell. When you do so, 1-2-3 stores it in the current cell.
4. The pointer should be located at cell A4. Type the number, 76, on the second line of the control panel and move the cell pointer down one cell.
5. The pointer should be located at cell A5. Type the number, 87, on the second line of the control panel and move the cell pointer down one cell.

Your worksheet should look something like this:

A5:

	A	B	C	D	E	F	G	H
1	GRADE							
2	AVERAGE							
3		98						
4		76						
5		87						
6	[	]						
7								

READ: RULES FOR ENTERING NUMBERS

There are a few rules you must follow when entering numbers. If an entry doesn't follow these rules, 1-2-3 won't accept it: When you press <Return>, it will beep and place you in Edit Mode (see below), with the cursor at the location or the problem.

Here are the Rules for entering numbers:

- A. A number may begin with a digit (0..9), a plus or minus sign, a period, or \$.
- B. A number may end with % to indicate percent. This character has the same effect as /100 - it divides the preceding number by 100.
- C. A number may have at most one decimal point (the period character).
- D. You may not use any commas or spaces when entering a number. But you can have 1-2-3 display numbers using commas and other formatting characters.
- E. You may end a number with a power-of-10 scaling factor called Scientific Format--xxxxxxE + nn

DO: ENTERING FORMULAS

If 1-2-3 did no more than record numbers and labels in a column-row structure, it would still be sitting on the shelf at your computer store. But it does much more than that.

Probably the single most powerful capability of the spreadsheet is formula calculation.

In any cell you can enter a formula--an instruction for 1-2-3 to calculate a number. Let's suppose we want to find the average of the test grades that you just entered. One way we could state this value is to type in the formula, $(98+76+87)/3$.

1. Move the pointer to cell A6.
2. Type the formula, $(98+76+87)/3$, on the second line of the control panel.

Notice that when you typed the first character of the formula, (, a VALUE indicator appeared in the upper right hand corner of the screen.

3. To tell 1-2-3 that you're finished typing an entry, move the cell pointer down one cell. When you do so, 1-2-3 stores the formula in the current cell.

Notice that the result of this calculation, 87, is displayed in the cell.

Your worksheet should look something like this:

A7:

	A	B	C	D	E	F	G	H
1	GRADE							
2	AVERAGE							
3		98						
4		76						
5		87						
6		87						
7	[		]					
8								

DO: A BETTER WAY TO ENTER FORMULAS

But there's got to be a better way! After all, the grades have already been entered in cells A3 through A5. Why should you have to enter the numbers again in order to get 1-2-3 to add them up. Fortunately you don't have to enter them again. Instead of telling 1-2-3 which numbers to add, you can tell it where to find the numbers:

1. Move the pointer to cell A6.
2. Type the formula, $(A3+A4+A5)/3$, on the second line of the control panel.
3. To tell 1-2-3 that you're finished typing an entry, move the cell pointer down one cell. When you do so, 1-2-3 stores the formula in the current cell.

Notice that the result of this calculation, 87, is displayed in the cell.

DO: AUTOMATIC RECALCULATION

1-2-3 automatically uses the numbers stored at the referenced locations whenever it calculates the formula. Any changes to numbers in the reference cells are automatically reflected in formula cells:

1. Move the pointer to cell A3.
2. Type the number, 89, on the second line of the control panel.
3. To tell 1-2-3 that you're finished typing an entry, move the cell pointer down one cell.

Notice that the formula in A6 was recalculated to reflect this change in the value at A3. The total at A6 now should be 84.

READ: LABEL PREFIX CHARACTERS

If the first character you type is not among those number-indicators already mentioned, 1-2-3 guesses that you mean to enter a label. It announces its guess after you type the first character by changing the READY indicator to LABEL.
(Exceptions: The slash character / starts a 1-2-3 command. Function keys F1 ...F10 invoke 1-2-3 functions.)

A few of the characters you can use to start a label are special:

- ' (apostrophe) left-aligned
- " (double-quotes) right-aligned
- ^ (caret) centered
- \ (backslash) repeating

DO: ENTERING LABEL-PREFIX CHARACTERS

The headings over the worksheet you have created would look much better if they were right aligned over the numbers:

1. Move the pointer to cell A1.
2. Re-enter the word, GRADE--this time to be right aligned--by typing "GRADE. When you have finished typing the entry, store the entry by moving the pointer to cell A2.
3. Re-enter the word, AVERAGE--this time to be right aligned--by typing "AVERAGE. When you have finished typing the entry, store the entry by moving the pointer to cell A3.

TYPING CELL ENTRIES 3-8

Your worksheet should look something like this:

A3: 89

-

	A	B	C	D	E	F	G	H
1	GRADE							
2	AVERAGE							
3	[	89]						
4		76						
5		87						
6		84						
7								

READ: LABELS THAT START WITH NUMBERS

Some labels start with numbers such as: 100 W. Main. And some numbers should be entered as labels. For instance, a social security number such as 585-54-3201 is not actually a number with which you are concerned about the numeric value. In fact, 1-2-3 would consider this as 585 minus 54 minus 3201.

Labels that start with numbers or numbers that should be considered labels should start with a label-prefix character. If you try to make an entry like, 100 W. Main, without a prefix, 1-2-3 will beep and place you in Edit Mode.

At first, these label-prefix characters may seem a bit tricky and elusive. Is the prefix character part of the label? Well, yes and no:

YES: 1-2-3 stores the prefix character you type as part of the cell entry. Once a label has been entered, you can see its prefix character by moving the cell pointer to the cell. The cell's contents are displayed on the first line of the control panel. 1-2-3 uses this prefix to align the label each time it displays the cell.

NOTE: If you don't enter a prefix character yourself, 1-2-3 supplies one when you press <<Return>>.

NOTE: The prefix character itself does not appear on the screen when 1-2-3 displays the cell.

READ: VALUE MODE AND LABEL MODE

Why does 1-2-3 distinguish between the processes of entering a numeric value (Value Mode) and entering a label (Label Mode)? There's a good reason for this. After you complete an entry, 1-2-3 must draw the distinction between a value and a label, since one is an instruction to calculate and the other merely a string of characters to be displayed. But why distinguish the entries while you're typing them?

The answer is that 1-2-3 allows you to do "something extra" when you're entering a number or formula--using the cell pointer to indicate the cells to be used in a formula, rather than typing their addresses.

READ: FIXING MISTAKES OR CHANGING YOUR MIND

One of the great advantages of 1-2-3 is the ease with which it allows you to change your mind. You can change an entry while you're in the middle of typing it or you can return to it later to revise or replace it. The same facilities are also handy on those rare occasions when you make a mistake.

We'll describe the various ways in which you can change entries, proceeding from the simple to the sophisticated.

- A. Cancellation. Whenever you're in Value Mode or Label Mode, you can cancel your entry and return to Ready Mode just by pressing [Esc]. However, you must do this before pressing <Return> or a pointer-movement key. If you're entering a formula and are in Point Mode when you decide to cancel, you may have to press [Esc] two or more times. As a shortcut, you can issue a Break--hold down the [Ctrl] key and press [Scroll Lock]. This always cancels whatever you're doing and returns you to Ready Mode.
- B. Replacement. The easiest way to change a short entry after it has been entered is to replace it with another. Just move the cell pointer to the cell, then type another entry. The cell's original contents are lost, so make sure you're replacing the right cell contents and not losing something valuable.
- C. Erasure. Use the 1-2-3 commands to erase the contents of one or more cells. Erasing is not the same as replacing with a few space-bar characters. A cell that has been erased contains no characters at all.

READ: THE BACKSPACE KEY

These three methods have the virtue of simplicity, but there is also a way to change an entry character-by-character, rather than simply starting over again.

The [**<**] Key. Located above <<Return>>, the [**<**] (<<Backspace>>) works very much like the backspace key on a typewriter. In Value or Label Mode, pressing the [**<**] key erases one character to the left.

READ: EDIT MODE

Sometimes, it's necessary to make a change other than erasing the last character you typed. For instance:

- o You are typing the label "Forth Quarter Profits -- 1982" and remember that the first word has a "u".
- o In reviewing a worksheet you've already created, you decide to replace C3 with C15 in the formula:

+D4*C3*@HLOOKUP(A7,D6..G14,3)

For this purpose, 1-2-3 has an Edit Mode. You can invoke Edit Mode while you're typing an entry. Or you can move the cell pointer to any cell that requires a change and revise its entry.

DO: ENTERING EDIT MODE

Although sometimes it would be far easier to edit a cell entry just by re-typing it, in the case of long formulas or labels, you would do better to edit your cell entry:

1. Move the pointer to cell A6.
2. To enter Edit Mode, press the F2 [Edit] key. The indicator in the upper right corner changes to EDIT. 1-2-3 places you in Edit Mode automatically if you enter a number or formula that it can't understand. For instance this occurs when you type a label that starts with a digit, but you forget the label-prefix.

In Edit mode, 1-2-3 places a copy of the cell's contents on the second line of the control panel. It places the cursor at the end of the entry. You can change the entry by moving the cursor, deleting characters, and inserting characters:

READ: MOVING THE CURSOR

In Edit Mode, these keys have different meaning than in Ready Mode:

Moving the cursor:

- <Left Arrow> - Move cursor one character to left
- <Right Arrow> - Move cursor one character to right
- <Tab Left> - Move cursor 5 characters to left
 (Hold <Shift> key and then press the
 <Tab> key -- equivalent to [Ctrl] <Left
 Arrow>)
- <Tab Right> - Move cursor 5 characters to right
 Equivalent to [Ctrl] <Right Arrow>
- [Home] - Move cursor to first character
- [End] - Move cursor to last character

Deleting:

- <Backspace> - Delete character preceding the cursor
- [Del] - Delete character at the cursor

Your personal computer's auto-repeat feature is particularly useful with these editing keys. When you hold a key down, it acts one, pauses for a short time, then repeatedly acts at about 2 strokes-per-second.

Inserting. Just type new characters to be inserted at the cursor position. 1-2-3 always inserts new characters in Edit Mode. There's no way to "overstrike" or "replace" characters in Release 1A. In Release 2 pressing the [Ins] key toggles to overstrike mode. When in overstrike mode, an OVR indicator is displayed at the bottom of the screen.

The F9 [Calc] Key. In Ready Mode, pressing the F9 [Calc] key causes 1-2-3 to perform a recalculation pass on all formulas in the worksheet. But you can also use [Calc] in Edit Mode, when you are editing a formula. It converts the formula into a number--the formula's current value. No general recalculation takes place.

Be careful--there's no way to convert the number back into the formula.

DO: EDITING A LABEL ENTRY

1. Move the pointer to cell A1.

2. To enter Edit Mode, press the F2 [Edit] key. The indicator in the upper right corner changes to EDIT. The label, GRADE, is displayed on the second line of the control panel. You are going to edit this to say, NW GRADES.
3. Use the <Left Arrow> key to move the cursor under the G in GRADE. Since the Edit Mode always inserts, just type the letters NW and a space and GRADE will move to the right as you type. When NW GRADE is printed on the display line, press <Return>.
4. Move the pointer to cell A2 and press F2 [Edit].
5. Type an S on the end of the label AVERAGE to make it AVERAGES.

Your worksheet should look something like this:

A3: 98

	A	B	C	D	E	F	G	H
1	NW GRADE							
2	AVERAGES							
3	[	89]						
4		76						
5		87						
6		84						
7								

READ: GETTING OUT OF EDIT MODE

When you are finished editing any entry, you can press <Return> to store the revised entry in the cell. 1-2-3 treats it exactly like any other new entry.

If you want to get fancy, there are a couple of alternatives. The vertical-motion pointer-movement keys--<Up Arrow>, <Down Arrow>, [Pg Up], [Pg Dn]--all store the edited entry and move the pointer, as described above. Be careful, though--the other pointer-movement keys have different meanings in Edit Mode.

If you invoked Edit Mode from Value (or Label) Mode, you can return there by pressing the F2 [Edit] key again. You can use the [Edit] key repeatedly while making a single entry to switch back and forth between Edit Mode and Value (or Label) Mode.

DO: END PROCESSING SESSION

You may now end the 1-2-3 processing session:

1. Press the / (slash) key.
2. Move the pointer to Quit and press <Return>.
3. Move the pointer to Yes and press <Return>.

You are now back to the Lotus Access System. You may remove the Lotus System Disk and your practice diskette from the diskette drives and power off the computer.

EXERCISES

(1) Describe the functions of each line of the Worksheet Control Panel:

a. Line 1: _____

b. Line 2: _____

c. Line 3: _____

(2) Name and describe three types of cell entries:

(a) _____

(b) _____

(c) _____

(3) List five rules for entering numbers into cells:

(a) _____

(b) _____

(c) _____

(d) _____

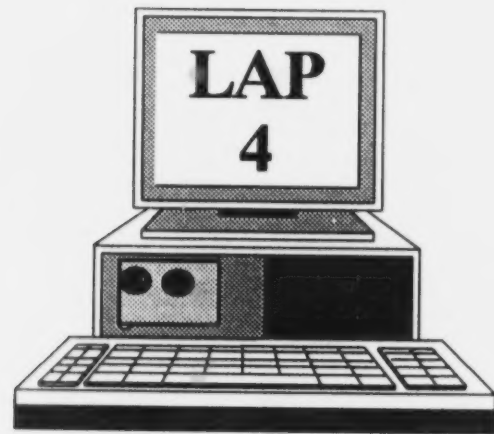
(e) _____

(4) Describe the function of each of the following label-prefix characters:

- a. ' (apostrophe)_____
- b. " (quotation marks)_____
- c. ^ (caret)_____
- d. \ (backslash)_____

(5) Describe the function of each of the following keys when using Edit Mode:

- a. <Left Arrow>_____
- b. <Right Arrow>_____
- c. <Tab Left>_____
- d. <Tab Right>_____
- e. [Home]_____
- f. [End]_____
- g. [Del]_____
- h. <Backspace>_____



LESSON 4
USING 1-2-3 COMMANDS

OBJECTIVES:

- * Selecting 1-2-3 commands
- * Revising entries and undoing commands
- * Using 1-2-3 menus
- * Selecting 1-2-3 menu choices

REQUIRED MATERIALS:

- * Paper and pen or pencil
- * A DOS diskette
- * Lotus 1-2-3 System Disk
- * A practice disk
- * IBM-PC with 1 or 2 diskette drives or hard disk and printer

READ: 1-2-3 COMMANDS

During every 1-2-3 session, you issue commands. For instance, the way to end a 1-2-3 session is to issue the /Quit command. Other 1-2-3 commands perform such functions as:

- o Copying, moving, deleting, and formatting worksheet data.
- o Transferring data between the worksheet and disk storage.
- o Printing reports.
- o Drawing graphs.
- o Handling databases.

1-2-3 commands are easy to use because they're interactive. A command may have one or more steps. At each step, 1-2-3 tells you what to enter next--a number, a range, a filename, etc. Messages from 1-2-3, called prompts, appear on the second line of the control panel. Some typical ones are:

Enter range to copy FROM:
Enter name of file to retrieve:
Enter Sort order (A or D):

After you've entered all the specifications, 1-2-3 executes the command and (usually) returns to Ready Mode. Let's take a closer look at each of the steps involved in issuing a 1-2-3 command.

READ: SELECTING A COMMAND

Each 1-2-3 command has a name, consisting of one or more command keywords, such as:

- /Copy
- /Range Erase
- /Worksheet Column-Width Set
- /Quit
- /Graph Options Titles

1-2-3's commands are organized into a multi-level menu system. You build up a command name by selecting one key word at a time from the command menus.

DO: STARTING 1-2-3

Start 1-2-3 using the appropriate Lotus 1-2-3 Start-Up Procedure.

DO: STARTING A 1-2-3 COMMAND

1. To start a command, press / (slash) when you're in READY mode. Several words have appeared on the second and third lines of the control panel. These are 1-2-3 commands.

Pressing the / (slash) key always invokes the 1-2-3 commands menu system. You may only start a 1-2-3 command when you are in READY mode.

2. To advance out of the menu system press [Esc]. The second and third lines of the control panel will be cleared.

Using the [Esc] key in the menu system is like re-tracing your steps through the menu system one step backwards for each time you press the [Esc] key.

READ: USING MENUS

One of the cardinal principles of the computer world is:

The more characters you type, the greater your chances of making a mistake.

One of the main questions asked by the users of computer programs is:

What do I do next?

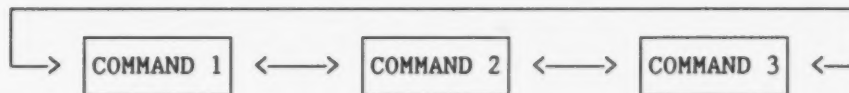
1-2-3 addresses both of these points by relying on menus to handle its communication with you. A menu is simply a list displayed in the control panel that informs you of your options and lets you select one of them.

In some cases the list of options on the menu is complete. When 1-2-3 shows you a list of command keywords, for example, that's all there is. You must select one of these keywords in order to proceed with the command.

In other cases, the menu is not restrictive. For example, when you issue the /File Save command, 1-2-3 displays a menu of currently existing worksheet files. You may choose one of these filenames, or you may type a completely new name.

READ: WHAT'S IN A MENU

A menu is a list of words. In the simplest cases (e.g. command keyword menus), the entire list fits on a single line, so the menu is structured as a simple ring:



Note that the first and last entries are "next to" each other--the list is like a ring.

READ: MULTIPLE-LINE MENUS

When there are more items in the menu than can fit in a single line, the list has a two-dimensional structure-- there's an up-down in addition to a left-right. Note that the first and last entries are still "next to" each other, even if they are several lines distant, and that several lines are linked together, again producing a "ring" structure:

READ: SELECTING MENU CHOICES

There are two ways to select a command from a menu--Pointing and Typing. You point by using the pointer movement keys to place the pointer on the command you wish to select and pressing <Return>. You type by typing the first letter of the command you wish to select.

Typing is quicker than pointing because it only takes a single key stroke while pointing may require several keystrokes to move the pointer and then you must press <Return>. Typing a command does not require you to press the <Return> key.

However, until you become more familiar with the 1-2-3 command menu system, most operation will request you to point to a command.

DO: POINTING TO MENU CHOICES

When 1-2-3 displays a menu, it changes the mode indicator in the upper right corner to MENU:

1. With 1-2-3 in READY mode, press the / . Notice that the mode indicator is now MENU.

Continued pressure (auto-repeat) on the <Right Arrow> or <Left Arrow> key will make the pointer visit every item on the menu.

The <Up Arrow> and <Down Arrow> keys work only if the menu takes up more than one line.

The arrow keys move the pointer to the next item in a particular direction. The [Home] and [End] keys jump to the first and last items on a menu.

2. Move the menu pointer to highlight the menu item, Files, and press <Return> to select the item.
3. Move the menu pointer to highlight the menu item, Directory, and press <Return> to select the item.

DO: RETURNING TO MENU MODE

To return to READY mode from MENU mode use the [Esc] key. [Esc] takes you backward one step for each time it is pressed:

1. Press the [Esc] key one time. This first [Esc] will erase what you have just typed had you typed any information on the control panel.

2. Press [Esc] again and you will return to MENU mode. Continue to press [Esc] until the control panel second and third lines are cleared and you are in READY mode.

When typing information, pressing [Esc] once will erase what you have just typed and pressing [Esc] again will return you to MENU mode.

DO: TYPING MENU CHOICES

As an alternative to pointing to your menu choice, you can type it:

1. With 1-2-3 in READY mode, press the / . Notice that the mode indicator is now MENU.
2. Type the letter, F, to select the Files option. When selecting a command keyword by typing, just press the first letter. 1-2-3 immediately goes to the next step of the command.
3. Press the letter, D, to select the Directory option.
4. Press the [Esc] key one time. This first [Esc] will erase what you have just typed on the control panel.
5. Press [Esc] again and you will return to MENU mode. Continue to press [Esc] until the control panel second and third lines are cleared and you are in READY mode.

READ: RESPONDING TO PROMPTS

When you select a command, 1-2-3 may prompt you to supply additional information. Sometimes you supply this information through additional menu choices. In these cases, the "additional information" menus on the third line of the control panel and the "keyword" menus on the second line of the control panel blend together--and, in fact, there's no particular need to distinguish among them.

In other cases, 1-2-3 prompts you to enter information on the second line of the control panel--a filename, a range specification, a label for a graph you're constructing, a number, etc.

READ: RESPONDING TO PROMPTS WITH FILENAMES

Whenever 1-2-3 prompts you to enter a filename, it helps you by displaying a menu that lists all files of the appropriate type that are stored on the current disk. You can select one of these names by pointing to it or you can enter any filename by typing it.

READ: RESPONDING TO PROMPTS WITH RANGE NAMES

When 1-2-3 prompts you to indicate a range, you can use the F3 [Name] key to display a menu of the currently-defined range names. You can select one of these names by pointing to it or you can enter any range by typing its name or the cell address of two diagonally opposite corners.

READ: TYPING NEW ENTRIES

In many cases 1-2-3 prompts you to type a new entry. In this case 1-2-3 automatically goes into EDIT mode so that you can use the pointer movement keys to revise your response as you are typing it.

READ: REVISING ENTRIES

In other cases 1-2-3 both displays a prompt and starts you out with some text--a default value or an entry that you previously made at the same prompt. The idea is that it is probably easier for you to accept or revise an existing entry than to type a new one from scratch.

DO: REVISING AN ENTRY BY TYPING COMMANDS

1. With 1-2-3 in READY mode, press the / .
2. Type W.
3. Type G.
4. Type F.
5. Type F again. Notice the number 2 is displayed on the entry line and the mode indicator is EDIT. Do not press <Return>.

You have just selected a command by using the typing method--that is, typing the first letter of 1-2-3 command. Another way we might express this command is by saying:

/Worksheet Global Format Fixed 2 <<Return>>

OR

/WGFF2 <Return>

DO: UNDOING COMMANDS

What happens if you issue the wrong command or you wish to discontinue with the command you have issued? If you catch yourself before 1-2-3 has executed the command, then it is simple. Each time you press [Esc] while you are entering a command, 1-2-3 backs up a step:

1. With the entry line prompting for the number of decimal places as the result of the last operation, press [Esc] one time.
2. Now press [Esc] four more times noticing how 1-2-3 backs up one step each time you press [Esc].

READ: READY MODE

After 1-2-3 executes a command, it usually returns to the READY mode. You can then enter another command, move the cell pointer, or type an entry.

In some cases, however, 1-2-3 anticipates that you will want to issue several related commands in succession. For this reason, it does not return to READY mode, but stays in the menu of related commands. Some examples of this are Print commands, Data commands, or Graph commands.

These menus all have Quit options to provide a path back to READY mode. In some cases several such menus stand between you and READY mode, requiring several Quits.

As an alternative to Quit, you can return to READY mode by "undoing" the command as explained above.

DO: END PROCESSING SESSION

You may now end the 1-2-3 processing session:

1. Press the / (slash) key.
2. Move the pointer to Quit and press <Return>.
3. Move the pointer to Yes and press <Return>.

You are now back to the Lotus Access System. You may remove the Lotus System Disk and your practice diskette from the diskette drives and power off the computer.

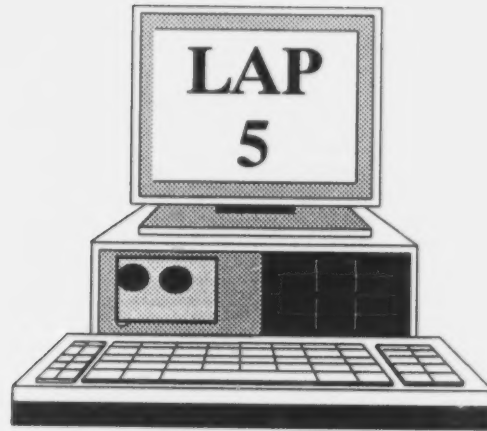
EXERCISES

(1) List five functions performed by 1-2-3 commands:

- (a) _____
- (b) _____
- (c) _____
- (d) _____
- (e) _____

(2) List two ways to select a 1-2-3 command:

- (a) _____
- (b) _____
- (c) Which method is faster? _____



LESSON 5

INDICATING CELL RANGES

OBJECTIVES:

- * Defining a worksheet range
- * Indicating cell ranges by typing cell addresses
- * Indicating cell ranges by expanding the cell pointer
- * Define the anchor cell and free cell
- * Explain the process for anchoring and unanchoring the pointer

REQUIRED MATERIALS:

- * Paper and pen or pencil
- * A DOS diskette
- * Lotus 1-2-3 System Disk
- * A practice disk
- * IBM-PC with 1 or 2 diskette drives or hard disk and printer

READ: INDICATING CELL RANGES

In many different situations you specify a range of cells for 1-2-3 to process as a unit. Sometimes 1-2-3 prompts you to indicate a range. For example:

- o In the /Copy command, you indicate the range of cells to copy from and the range to copy to.
- o In the /Move command, you indicate the range of cells to be relocated to another part of the worksheet.
- o In the /Print command, you indicate a range of cells to be printed.

You may also specify ranges as arguments to some of 1-2-3's functions. In such cases, the program doesn't prompt you to indicate a range--you must be aware of the correct way to use the function.

READ: WHAT'S IN A RANGE?

A range is a group of one or more cells in a rectangular block. Since a range is a rectangle, you can identify it by naming the cells in two diagonally-opposite corners.

READ: HOW TO INDICATE A RANGE

How can you indicate a range to 1-2-3? There are three ways:

- o Typing cell addresses.
- o Expanding the cell pointer to highlight the entire range.
- o Using a range name.

DO: STARTING 1-2-3

Start 1-2-3 using the appropriate Lotus 1-2-3 Start-Up Procedure.

READ: TYPING CELL ADDRESSES

You can specify a range by typing the address of any two diagonally opposite corners. You must use at least one period to separate the two addresses; more than one is fine. 1-2-3 always displays exactly two periods. Spaces, however, are forbidden.

In most situations calling for a range, you can use a single cell address. That's because a single cell is a range--the smallest possible one. Some commands and functions, however, require you to indicate a range consisting of more than one cell.

DO: INDICATING A RANGE BY TYPING CELL ADDRESSES

Let's say you want to erase the contents of a range of cells. The 1-2-3 command for this is /Range Erase:

1. Move the pointer to cell A1.
2. Type / then press the letter R then press the letter E.
3. At the range prompt type, C4.E8 and press <Return>.

Nothing is changed on the worksheet since these cells were already empty.

INDICATING CELL RANGES 5-2

If you are typing a range specification in response to a 1-2-3 prompt, be sure to press <Return> when you are finished.

If you are indicating the range in the middle of a formula, don't press <Return> right away--you must complete the formula first.

READ: EXPANDING THE CELL POINTER

When the cell pointer is "resting" in READY mode, it highlights a single cell in the worksheet. But when you are entering a formula or responding to certain 1-2-3 prompts, you can expand the pointer to highlight an entire range.

The same keys that move the cell pointer also cause it to expand, but only after one corner of the pointer has been anchored.

DO: INDICATING A FORMULA RANGE BY EXPANDING THE CELL POINTER

Let's say you want to sum the contents of a range of cells. The 1-2-3 function for this is @SUM. The 1-2-3 formula for this is @SUM(beginning range . . ending range).

1. Move the pointer to cell A1 and type 100.
2. Move the pointer to cell A2 and type 200.
3. Move the pointer to cell A3 and type 300.
4. Move the pointer to cell A4 and type @SUM(
5. Move the pointer to cell A1 and anchor it by pressing the . (period).
6. Now move the pointer to cell A3. Notice that the rectangular area indicated by "pointing" to the cell addresses is highlighted as you move the pointer. Type) and press <Return> to finish the command.

The result of the formula, 600, should be displayed in cell A4.

DO: USING A 1-2-3 COMMAND AND EXPANDING THE CELL POINTER

Let's say you want to erase the contents of a range of cells. The 1-2-3 command for this is /Range Erase:

1. Move the pointer to cell A1.
2. Type / then press the letter R then press the letter E.
3. At the range prompt press [Esc] to unanchor the pointer and move the pointer to cell C4 and press the . (period) to re-anchor the pointer.
4. Now move the pointer to cell E8. Notice that the rectangular area indicated by "pointing" to the cell addresses is highlighted as you move the pointer. Press <Return> to finish the command.
5. Now erase the range of cells you previously typed in by moving the pointer to cell A1, type the / then press the letter R then press the letter E. At the range prompt move the pointer to cell A4 and then press <Return> to erase that range of cells.

READ: POINTING TO RANGES: THE WHOLE STORY

Having practiced these operations, let's consider the whole issue of indicating ranges with the cell pointer.

The expanded cell pointer always covers the rectangle determined by the anchor cell and the free cell.

Anchor Cell. One corner of the pointer is anchored to a particular cell, which we call the anchor cell.

Free Cell. The corner diagonally opposite the anchored corner is free to move anywhere in the worksheet. The location of the unanchored corner is called the free cell. As you move the free corner around the worksheet, 1-2-3 adjusts the window, if necessary, to keep this corner on-screen. 1-2-3 displays a blinking underscore character in the middle of the free cell to remind you where it is. You may move the free corner with the familiar pointer-movement keys.

READ: ANCHORING AND UNANCHORING THE CELL POINTER

When it prompts you to enter a range, 1-2-3 often anchors the cell pointer on the current cell automatically. There are many situations, though, in which you have to do your own anchoring (and unanchoring). Here are the tools:

INDICATING CELL RANGES 5-4

The Period Key. If the pointer is not already anchored, pressing the period anchors one corner of the cell pointer to the current cell. The free corner is also on this cell for the moment, so that the current cell is the entire range. 1-2-3 shows this by displaying the one-cell range in the control panel.

If the pointer is already anchored, pressing period moves the anchor to the next corner of the expanded pointer, usually in the clockwise direction. (Which direction it goes in a particular case depends on how you've expanded the pointer.)

As a result, the free corner indicated by the blinking underscore also moves to be diagonally opposite the new anchor. (1-2-3 may readjust the window at this point, in order to keep the free corner on-screen.)

The [Esc] Key. If the pointer is not already anchored, pressing [Esc] when 1-2-3 is prompting you to indicate a range returns you to the previous command step. In a formula, pressing [Esc] returns the cell pointer to the current cell and erases the cell address from the end of the formula.

If the pointer is already anchored, pressing [Esc] once has a double effect: (1) it shrinks the expanded pointer so that it covers only the anchored cell, and (2) it removes the anchor. This allows you to relocate the pointer then reanchor it, using the pointer-movement keys and the period key.

For example:

```

                                | anchored
before pressing [Esc]:  G30 . . J41
after pressing [Esc]:  G30
                                | not anchored
```

The Backspace Key. Whether or not the pointer is anchored, pressing the backspace key cancels the range specification and returns the cell pointer, unanchored, to the current cell--where the pointer was located when you began the command or formula. As with [Esc], 1-2-3 remains in POINT mode so that you can begin the anchoring and expanding process anew. This is useful when you want 1-2-3 to "forget" a range it remembers in association with a command.

DO: END PROCESSING SESSION

You may now end the 1-2-3 processing session:

1. Press the / (slash) key.
2. Move the pointer to Quit and press <Return>.
3. Move the pointer to Yes and press <Return>.

You are now back to the Lotus Access System. You may remove the Lotus System Disk and your practice diskette from the diskette drives and power off the computer.

EXERCISES

Draw the following ranges as a rectangle on the worksheet below and label each rectangle with the corresponding letter of that range:

- (1) RANGE A: A2..C5
- (2) RANGE B: D4..F7
- (3) RANGE C: D19..B15
- (4) RANGE D: H17..G20
- (5) RANGE E: A12..C10

	A	B	C	D	E	F	G	H
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

- (6) Define the following cells:

a. Anchor Cell: _____

b. Free Cell: _____

Describe the function of the following keys if (1) the pointer is not anchored, or (2) the pointer is anchored:

(7) The Period Key:

(a) _____

(b) _____

(8) The [Esc] Key:

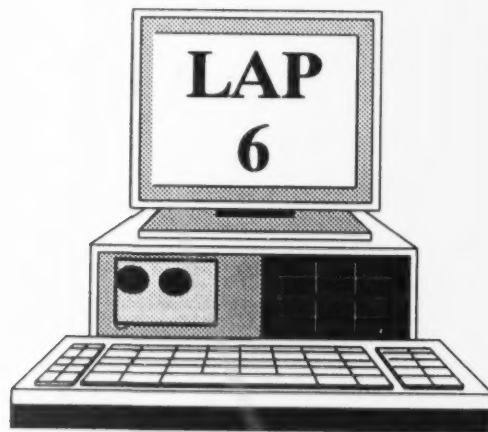
(a) _____

(b) _____

(9) The Backspace Key:

(a) _____

(b) _____



LESSON 6

BUILDING A SIMPLE WORKSHEET

OBJECTIVES:

- * Entering and formatting labels on a worksheet
- * Entering numbers and formulas into a worksheet
- * Performing basic arithmetic operations on a worksheet
- * Saving a worksheet to the disk
- * Printing a worksheet to the printer
- * Exiting the 1-2-3 worksheet program

REQUIRED MATERIALS:

- * Paper and pen or pencil
- * A DOS diskette
- * Lotus 1-2-3 System Disk
- * A practice disk
- * IBM-PC with 1 or 2 diskette drives or hard disk and printer

READ: A SALES FORECAST

Suppose we want to create a worksheet that will perform a simple sales forecast for the coming year. Your company has four products (A, B, C, and D) that it sells in four territories. First you would organize the sales by product and territory and then you could calculate the totals and percentages. Your result could look something like this worksheet:

REGIONAL SALES ANALYSIS FOR 1985

PRODUCT	NORTH	EAST	SOUTH	WEST	TOTAL	%
A	2000	4000	2000	4000	12000	30
B	3000	3000	2000	4000	12000	30
C	2000	3000	2000	3000	10000	25
D	1000	1000	2000	2000	6000	15
TOTAL	8000	11000	8000	13000	40000	100

BUILDING A SIMPLE WORKSHEET 6-1

This worksheet consists of labels such as the title and column headings, numbers such as the sales amount for each region, and formulas such as the calculated totals by product and by region and the calculated percentage of sales.

DO: STARTING 1-2-3

Start 1-2-3 using the appropriate Lotus 1-2-3 Start-Up Procedure.

DO: ENTERING THE WORKSHEET HEADINGS

1. Place the pointer on cell A1, and type the worksheet title, **REGIONAL SALES ANALYSIS FOR 1985.**

Be certain that you are in CAPS mode to type in all capital letters. If you make a typing error, use the <<Backspace>> key to type over it and continue typing.

Notice that this label is longer than the width of the cell into which you are typing it. This is called a "long label" and continues over any empty cells to its right.

2. Move the pointer to cell A3 and type, **PRODUCT.**
3. Move the pointer to cell B3 and type, **"NORTH.**

Notice that the label prefix, " (quotation mark), caused the label to be right-justified in the cell.

Note: It is a good rule to right-justify column headings over columns of numbers and left-justify column headings over columns of labels.

4. Move the pointer to cell C3 and type, **"EAST.**
5. Move the pointer to cell D3 and type, **"SOUTH.**
6. Move the pointer to cell E3 and type, **"WEST.**
7. Move the pointer to cell F3 and type, **"TOTAL.**
8. Move the pointer to cell G3 and type, **"% (percent sign).**
9. Move the pointer to cell A10 and type, **TOTAL.** Press <Return> to store the label.

Note: At this point all the column headings have been typed in and you are ready to type in the worksheet data.

Your worksheet should look like this:

A10: 'TOTAL

	A	B	C	D	E	F	G
1	REGIONAL SALES ANALYSIS FOR 1985						
2							
3	PRODUCT	NORTH	EAST	SOUTH	WEST	TOTAL	%
4							
5							
6							
7							
8							
9							
10	[TOTAL]						

DO: ENTER THE WORKSHEET DATA

1. Move the pointer to cell A5 and type, A. This is column data and not the column heading, so it is not right-justified.
2. Move the pointer to cell B5 and type, 2000. This is a number, so notice that 1-2-3 automatically right-justifies it in the column.
3. Now enter the rest of the product data for each region. Do not enter anything in the TOTAL column or row and do not enter anything in the % column at this point.

After you finish entering the product data your worksheet should look like this:

E8: 2000

	A	B	C	D	E	F	G
1	REGIONAL SALES ANALYSIS FOR 1985						
2							
3	PRODUCT	NORTH	EAST	SOUTH	WEST	TOTAL	%
4							
5	A	2000	4000	2000	4000		
6	B	3000	3000	2000	4000		
7	C	2000	3000	2000	3000		
8	D	1000	1000	2000	[2000]		
9							
10	TOTAL						

DO: ENTER THE WORKSHEET TOTALS

Now that you have entered the worksheet headings and data, you need to make 1-2-3 do what it does best--perform calculations.

The worksheet has two areas for totals. A TOTAL column contains the product total with the sum for each product sold in all regions. A TOTAL row contains the regional total with the sum for each region for all products.

1. Move the pointer to cell F5 and type +B5+C5+D5+E5.

Notice that this formula started with a + (plus sign). If the plus sign had not been typed first, the formula would have started with a cell reference letter. Since it was a letter of the alphabet, 1-2-3 would have interpreted this formula as a label and no calculation would have been performed.

Formulas are values. Since many formulas begin with a cell reference, you must begin the formula with a value prefix such as a + (plus sign) or ((left parenthesis).

2. Move the pointer to cell F6 and type, +B6+C6+D6+E6.

Notice that when you moved the cursor from F5 to F6 the result of the calculation, 12000, was displayed in cell F5, and not the formula itself.

3. Move the pointer to cell F7 and type, +B7+C7+D7+E7.

4. Move the pointer to cell F8 and type, +B8+C8+D8+E8. Press <Return> to store the formula. Now you need to sum the columns for North, East, South, and West.

5. Move the pointer to cell B10 and enter the formula to sum the sales for the NORTH region. Don't forget to start the formulas with a + (plus sign) so that 1-2-3 knows you are entering a value and not a label. Also, find the total of the TOTAL column.

When you have finished with all the totals formulas, your worksheet should look like this:

F10: +F5+F6+F7+F8

	A	B	C	D	E	F	G
1	REGIONAL SALES ANALYSIS FOR 1985						
2							
3	PRODUCT	NORTH	EAST	SOUTH	WEST	TOTAL	%
4							
5	A	2000	4000	2000	4000	12000	
6	B	3000	3000	2000	4000	12000	
7	C	2000	3000	2000	3000	10000	
8	D	1000	1000	2000	2000	6000	
9							
10	TOTAL	8000	11000	8000	13000	[40000]	

DO: CALCULATE THE PERCENTAGE OF SALES

The column under the % (percent sign) contains a percentage expressing the ratio of the sales of each product to the total sales of all products. The formula to express this ratio would be:

Product Sales Divided by Total Sales Multiplied by 100

1. Move the pointer to cell G5 and type, +F5/F10*100. The / (slash) is the division sign and the * (asterisk) is the multiplication sign.
2. Move the pointer to cell G6 and type, +F6/F10*100.
3. Move the pointer to cell G7 and type, +F7/F10*100.
4. Move the pointer to cell G8 and type, +F8/F10*100.
5. Now move the pointer to cell G10 and sum the % column. The total for the % column should be 100.

Your completed worksheet should now look like this:

G10: +G5+G6+G7+G8

	A	B	C	D	E	F	G
1	REGIONAL SALES ANALYSIS FOR 1985						
2							
3	PRODUCT	NORTH	EAST	SOUTH	WEST	TOTAL	%
4							
5	A	2000	4000	2000	4000	12000	30
6	B	3000	3000	2000	4000	12000	30
7	C	2000	3000	2000	3000	10000	25
8	D	1000	1000	2000	2000	6000	15
9							
10	TOTAL	8000	11000	8000	13000	40000	[100]

DO: SAVING YOUR WORKSHEET

To save your worksheet to the practice disk, it is necessary to use some 1-2-3 commands. 1-2-3 Commands is the topic of a later unit in this sequence.

1. Be certain that you have completed your worksheet. With the pointer located at any cell location, type /.
2. When you press the /, several 1-2-3 commands appear on both the second and third lines of the control panel. Move the pointer to the **File** command and press **<Return>**.
3. Now the second and third lines of the control panel are filled with different 1-2-3 commands. Move the pointer to the **Save** command and press **<Return>**.
4. At the prompt to enter the file name, type **SALES** (in upper or lower case) and press **<Return>**. You should see the disk drive light come on momentarily on Drive B as the worksheet is saved to the disk.

DO: PRINTING THE WORKSHEET

To obtain a hard copy (print-out) of your completed worksheet, it is necessary to use some more 1-2-3 commands. Be certain that your printer is powered on.

1. Press the / to invoke the 1-2-3 command menu.
2. Move the pointer to **Print** and press **<Return>**.

3. Move the pointer to **Printer** and press **<Return>**.
4. Move the pointer to **Range** and press **<Return>**.
5. To specify the range to be printed, move the pointer to cell **A1** (if it is not already there) and press the **.** (period) key and then move the pointer to cell **G10** and press **<Return>**.
6. Make certain the printer is turned on and that the paper is properly positioned at the top of form.
7. Move the pointer to **Align** and press **<Return>** in order to inform 1-2-3 that the paper has been positioned or re-positioned.
8. Now move the pointer to **Go** and press **<Return>**. The printer should be printing a copy of your worksheet on the printer.
9. Move the pointer to **Quit** and press **<Return>** to quit the Print Menu.

DO: **END PROCESSING SESSION**

You may now end the 1-2-3 processing session:

1. Press the **/** (slash) key.
2. Move the pointer to **Quit** and press **<Return>**.
3. Move the pointer to **Yes** and press **<Return>**.

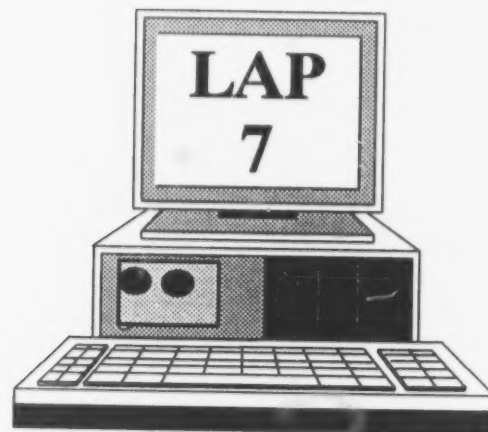
You are now back to the Lotus Access System. You may remove the Lotus System Disk and your practice diskette from the diskette drives and power off the computer.

EXERCISES

- (1) Use the Lotus 1-2-3 Start-Up Procedure and create a worksheet using the following information:

	A	B	C	D	E	F	G
1	EXPENSE SUMMARY FOR 1986						
2							
3	EXPENSE	FIRST	SECOND	THIRD	FOURTH	TOTAL	%
4		QUARTER	QUARTER	QUARTER	QUARTER		
5							
6	RENT	1200	1200	1200	1200		
7	UTILITY	400	300	600	300		
8	PHONE	100	100	100	200		
9	SALARY	1000	1000	1200	1200		
10							
11	TOTAL						

- (2) Enter formulas in each of the TOTAL cells, totaling both across and down. Enter formulas in the % cells which divides each row total by the grand total and multiplies by 100 (don't worry if some answers have decimals).
- (3) Save the worksheet and EXPSUMM.
- (4) Obtain a print of the worksheet.



LESSON 7

BUILDING A SIMPLE DATABASE

OBJECTIVES:

- * Entering and formatting labels on a worksheet database
- * Entering database data into a worksheet
- * Setting appropriate column widths for database data
- * Saving a worksheet database to the disk
- * Sorting a database
- * Exiting that database command menu
- * Printing a worksheet to the printer
- * Exiting the 1-2-3 worksheet program

REQUIRED MATERIALS:

- * Paper and pen or pencil
- * A DOS diskette
- * Lotus 1-2-3 System Disk
- * A practice disk
- * IBM-PC with 1 or 2 diskette drives or hard disk and printer

READ: A STUDENT ENROLLMENT DATABASE

Any collection of data that you can organize in fields and records can become a 1-2-3 database. 1-2-3 databases are manipulated using the /Data commands.

Suppose we want to create a database to store student enrollment at the vo-tech center. You decide you need to store the following information about each student. . .

Last Name	First Name
Department	Instructor
Room No.	Time
Grade	Age

. . . using the following data:

Alexander, Ursula, Welding, Ward, 508, AM, 11, 16
 Williams, Stan, Carpentry, Gipson, 405, AM, 13, 38
 Clark, Marla, Accounting, Smith, 201, PM, 12, 17
 Griffith, Sam, Computers, Pryor, 105, AM, 11, 15
 Collins, Rhonda, Secretarial, Croom, 106, AM, 13, 27
 Arthur, Bob, Drafting, Hinman, 211, PM, 13, 22
 Fredericks, Bobby, Computers, Pryor, 105, PM, 12, 17
 Grimley, Everett, Electrical, Keeton, 200, PM, 11, 16
 Davis, Ann, Secretarial, Croom, 106, PM, 12, 17
 Jackson, Donald, Drafting, Hinman, 211, AM, 12, 17
 Ingrams, Annette, Computers, Pryor, 105, PM, 12, 17
 Russell, Susan, Carpentry, Gipson, 405, PM, 12, 17
 Peters, Danny, Secretarial, Croom, 106, AM, 11, 16
 Higgins, Pete, Electrical, Keeton, 200, AM, 13, 35
 Madison, Jamie, Welding, Ward, 508, PM, 12, 17
 Howard, Becky, Drafting, Hinman, 211, PM, 13, 19
 Larson, Sarah, Computers, Pryor, 105, AM, 13, 21
 Morrison, Wendell, Carpentry, Gipson, 405, AM, 11, 16
 Ashley, Valerie, Secretarial, Croom, 106, PM, 12, 17
 Mosley, Eddie, Accounting, Smith, 201, PM, 11, 16
 Hill, Kimberly, Accounting, Smith, 201, AM, 12, 17
 Miller, Diane, Computers, Pryor, 105, PM, 13, 25
 Brown, Thurman, Welding, Ward, 508, AM, 13, 35
 Andrews, Judy, Secretarial, Croom, 106, AM, 13, 25
 Harris, Jane, Electrical, Keeton, 200, PM, 11, 16

DO: STARTING 1-2-3

Start 1-2-3 using the appropriate Lotus 1-2-3 Start-Up Procedure.

DO: ENTERING THE DATABASE HEADINGS

1. Place the pointer on cell A1, and type the worksheet title, **STUDENT ENROLLMENT FOR 1985** .

Be certain that you are in CAPS mode to type in all capital letters. If you make a typing error, use the <Backspace> key to type over it and continue typing.

Notice that this label is longer than the width of the cell into which you are typing. This is called a "long label" and continues over any empty cells to its right.

2. Move the pointer to cell A3 and type, **LAST** .
3. Move the pointer to cell B3 and type, **FIRST** .
4. Move the pointer to cell C3 and type, **DEPT** .

5. Move the pointer to cell D3 and type, INSTRUCT.
6. Move the pointer to cell E3 and type, "ROOM.

Notice that the label prefix, " (quotation mark), caused the label to be right-justified in the cell. It is a good rule to right-justify column headings over columns of numbers and left-justify column headings over columns of labels.

7. Move the pointer to cell F3 and type, "TIME.
8. Move the pointer to cell G3 and type, "GRADE.
9. Move the pointer to cell H3 and type, "AGE , and press <Return> to store the label.

At this point all the column headings have been typed in and you are ready to type in the worksheet data.

Your worksheet should look like this:

H3: "AGE

	A	B	C	D	E	F	G	H
1	STUDENT ENROLLMENT FOR 1985							
2								
3	LAST	FIRST	DEPT	INSTRUCT	ROOM	TIME	GRADE	AGE
4								
5								

DO: ENTER THE DATABASE DATA

1. Move the pointer to cell A4 and type, Alexander.
2. Move the pointer to cell B4 and type, Ursula.
3. Move the pointer to cell C4 and type, Welding.
4. Move the pointer to cell D4 and type, Ward.
5. Move the pointer to cell E4 and type, 508.
6. Move the pointer to cell F4 and type, "AM.
7. Move the pointer to cell G4 and type, 11.

8. Move the pointer to cell H4 and type, 16 .
Now enter the enrollment data for the remainder of the students listed on the first page of this unit. Use the same format for each cell entry as shown above.

9. After you finish entering the student data, press [Home].

The portion of the worksheet that is displayed on the screen should look like this:

A1: 'STUDENT ENROLLMENT FOR 1985

	A	B	C	D	E	F	G	H
1	[STUDENT]ENROLLMENT FOR 1985							
2								
3	LAST	FIRST	DEPT	INSTRUCT	ROOM	TIME	GRADE	AGE
4	Alexander	Ursula	Welding	Ward	508	AM	11	16
5	Williams	Stan	Carpentry	Gipson	405	AM	13	38
6	Clark	Marla	Accountin	Smith	201	PM	12	17
7	Griffith	Sam	Computers	Pryor	105	AM	11	15
8	Collins	Rhonda	Secretari	Croom	106	AM	13	27
9	Arthur	Bob	Drafting	Hinman	211	PM	13	22
10	Frederick	Bobby	Computers	Pryor	105	PM	12	17
11	Grimley	Everett	Electrica	Keeton	200	PM	11	16
12	Davis	Ann	Secretari	Croom	106	PM	12	17
13	Jackson	Donald	Drafting	Hinman	211	AM	12	17
14	Ingrams	Annette	Computers	Pryor	105	PM	12	17
15	Russell	Susan	Carpentry	Gipson	405	PM	12	17
16	Peters	Danny	Secretari	Croom	106	AM	11	16
17	Higgins	Pete	Electrica	Keeton	200	AM	13	35
18	Madison	Jamie	Welding	Ward	508	PM	12	17
19	Howard	Becky	Drafting	Hinman	211	PM	13	19
20	Larson	Sarah	Computers	Pryor	105	AM	13	21

DO: SET THE COLUMN WIDTHS

Notice that some of the column-widths are too large and some of them too small for the data that is contained in them. Let's adjust some of the column-widths.

To set the column-widths of the worksheet, it is necessary to use some 1-2-3 commands. 1-2-3 Commands is the topic of a later unit in this sequence.

1. Locate the pointer at any cell in column A and type /.

2. When you press the /, several 1-2-3 commands appear on both the second and third lines of the control panel. Move the pointer to the **Worksheet** command and press <Return>.
3. Now the second and third lines of the control panel are filled with different 1-2-3 commands. Move the pointer to the **Column** command and press <Return>.
4. Move the pointer to the **Set-Width** command and press <Return>.
5. At the prompt to enter a column width type, overstrike the 9 with the number 12 and press <Return>.
6. Move the pointer to column B and repeat the operation, this time setting the width to 10:

/Worksheet Column Set-Width 10 <Return>

7. Move the pointer to column C and set the width to 12.
8. Move the pointer to column E and set the width to 6.
9. Move the pointer to column F and set the width to 6.
10. Move the pointer to column G and set the width to 7.
11. Move the pointer to column H and set the width to 5.

DO: SAVING YOUR WORKSHEET

To save your worksheet to the practice disk, it is necessary to use some 1-2-3 commands. 1-2-3 Commands is the topic of a later unit in this sequence.

Since we are going to manipulate the database in several ways, it is best to save an original version of the database before performing any /Data commands:

1. Be certain that you have completed your worksheet. With the pointer located at any cell location, type /.
2. When you press the /, several 1-2-3 commands appear on both the second and third lines of the control panel. Move the pointer to the **File** command and press <Return>.
3. Now the second and third lines of the control panel are filled with different 1-2-3 commands. Move the pointer to the **Save** command and press <Return>.

4. At the prompt to enter the file name, type STUDENRL (in upper or lower case) and press <Return>. You should see the disk drive light come on momentarily on Drive B as the worksheet is saved to the disk.

DO: SORTING DATABASE RECORDS

Currently the records are in the order in which they were entered into the worksheet database. You will not always want to refer to records in the order in which they were entered in the database. Suppose that you want an alphabetical listing of the database. The /Data Sort command lets you do that:

1. Move the pointer to cell A4 and press / to invoke the 1-2-3 command menu.
2. Move the pointer to Data and press <Return>.
3. Move the pointer to Sort and press <Return>.
4. Before you can sort the records, you must specify a range you want to sort, called the data range. This should include all records and all fields in the database or the sort will jumble your records by sorting some fields and not others. Move the pointer to Data-Range and press <Return>.
5. At the prompt to enter a range, press . (period) to anchor the cell range on A4. Then move the pointer to cell H28 and press <Return>.

Notice that you do not include the field names or any headings since you do not want to sort the field name headings along with your data.

6. Now you must specify how you want to sort the database. 1-2-3 needs to know which field to use to determine the new order of records. This field is called the sort key. You want to sort by Last Name. Move the pointer to Primary-Key and press <Return>.
7. You specify a sort key by indicating any cell in the appropriate field (or column). Move the pointer to column A and press <Return>. Type A for ascending order since you want an alphabetical listing and press <Return>.
8. Finally, move the pointer to Go and press <Return>.

Your database is now in sorted order by Last Name.

READ: SECONDARY SORT KEY

The secondary sort key is optional and is used to break ties that occur when two or more records have the same entry in the primary sort key field. We would have used this if there were more than one person with the same last name.

DO: SAVE THE SORTED DATABASE

If you sorted your database correctly, you may wish to save or replace the old version of the database with the new sorted version:

1. Be certain that you have completed your worksheet. With the pointer located at any cell location, type / to invoke the 1-2-3 command menu.
2. Move the pointer to the **File** command and press **<Return>**.
3. Now the second and third lines of the control panel are filled with different 1-2-3 commands. Move the pointer to the **Save** command and press **<Return>**.
4. At the prompt to enter the file name, type **STUDENRL** (in upper or lower case) and press **<Return>** or just press **<Return>** (the file name is already there). You should see the disk drive light come on momentarily on Drive B as the worksheet is saved to the disk.
5. Since the file has already been created, move the pointer to **Replace** and press **<Return>** to replace the old version of the file with the new version.

DO: PRINTING THE WORKSHEET

To obtain a hard copy (print-out) of your completed worksheet, it is necessary to use some more 1-2-3 commands. Be certain that your printer is powered on.

1. Press the / to invoke the 1-2-3 command menu.
2. Move the pointer to **Print** and press **<Return>**.
3. Move the pointer to **Printer** and press **<Return>**.
4. Move the pointer to **Range** and press **<Return>**.

5. To specify the range to be printed, move the pointer to cell A1 (if it is not already there) and press the . (period) key and then move the pointer to cell H28 and press <Return>.
6. Make certain the printer is turned on and that the paper is properly positioned at the top of form.
7. Move the pointer to Align and press <Return> in order to inform 1-2-3 that the paper has been positioned or re-positioned.
8. Now move the pointer to Go and press <Return>. The printer should be printing a copy of your worksheet on the printer.
9. Move the pointer to Quit and press <Return> to quit the Print Menu.

DO: END PROCESSING SESSION

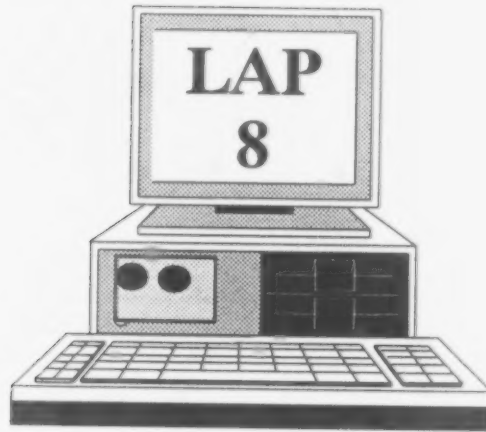
You may now end the 1-2-3 processing session:

1. Press the / (slash) key.
2. Move the pointer to Quit and press <Return>.
3. Move the pointer to Yes and press <Return>.

You are now back to the Lotus Access System. You may remove the Lotus System Disk and your practice diskette from the diskette drives and power off the computer.

EXERCISES

- (1) Load the worksheet, STUDENRL, into the work area. Sort the worksheet by Instructor. Print the worksheet.
- (2) Load the worksheet, STUDENRL, into the work area. Sort the worksheet by Department. Print the worksheet.
- (3) Load the worksheet, STUDENRL, into the work area. Sort the worksheet by Room Number as the primary key and Time as the secondary key. Print the worksheet.



LESSON 8

BUILDING A SIMPLE GRAPH

OBJECTIVES:

- * Explain types of graphs created by 1-2-3
- * Retrieving a worksheet file from the disk
- * Creating and viewing a pie chart
- * Shading and exploding a pie chart
- * Creating and viewing a bar graph
- * Putting titles on a bar graph
- * Printing a graph using the PrintGraph program

REQUIRED MATERIALS:

- * Paper and pen or pencil
- * A DOS diskette
- * Lotus 1-2-3 System Disk
- * A practice disk
- * IBM-PC with 1 or 2 diskette drives or hard disk and printer

READ: TYPES OF GRAPHS

You can create graphs from worksheet data and view them on the display screen if your computer monitor has graphics capability and/or you can print it on the printer if your printer has graphics capability or a plotter.

Graphs are organized according to an X and a Y axis. The X axis is the horizontal range in the graph. The Y axis is the vertical range in the graph. The Y axis can be set with as many as six ranges named A through F.

1-2-3 uses different types of graphs to display the data. The types of graphs that are available with 1-2-3 are:

- o Line Graph. A line graph represents each value with a point at an appropriate distance above the horizontal axis. You may create up to six lines on a single graph. 1-2-3 uses different symbols to identify the points on each line.

- o Bar Graph. A bar graph represents each value in a range with a bar of varying height. You may create a single-range bar graph, which compares values in one set of data to each other, or a multiple range bar graph, which displays comparable values from up to six sets of data at each point along the X axis. In a multiple-range bar graph, 1-2-3 uses a variety of shadings or colors to identify the bars for each data range.
- o XY Graph. In an XY graph, 1-2-3 pairs each value from the X range with the corresponding value from each of the values in the Y range to plot points on the graph. You may create up to six lines on a single XY graph. 1-2-3 uses different symbols to identify the points on each line.
- o Stacked Bar Graph. In a stacked bar graph, 1-2-3 displays the corresponding value from each data range stacked above the preceding value in each bar. You can create stacked bar graphs that show up to six corresponding values at each point along the X axis. 1-2-3 uses different shadings or color to represent each data range.
- o Pie Chart. A pie chart compares parts to the whole, so each value in the range is a wedge of the pie. In addition you can indicate shadings or colors for each of the pie wedges and you can explode one or more wedges of the pie to emphasize a particular value or values.

The following page shows some examples of these various types of graphs.

1-2-3 GRAPHS

BUILDING A SIMPLE GRAPH 8-3

READ: GRAPHING A SALES ANALYSIS

Suppose we want to show the Regional Sales Analysis for 1985 worksheet created in a previous module in graph form.

Your present worksheet is organized like this:

REGIONAL SALES ANALYSIS FOR 1985

PRODUCT	NORTH	EAST	SOUTH	WEST	TOTAL	%
A	2000	4000	2000	4000	12000	30
B	3000	3000	2000	4000	12000	30
C	2000	3000	2000	3000	10000	25
D	1000	1000	2000	2000	6000	15
TOTAL	8000	11000	8000	13000	40000	100

DO: STARTING 1-2-3

Start 1-2-3 using the appropriate Lotus 1-2-3 Start-Up Procedure.

DO: RETRIEVE THE WORKSHEET

To load a copy of your worksheet, SALES, from the practice disk to computer memory, it is necessary to use some 1-2-3 commands.

We will use the /File Retrieve to load the SALES worksheet into computer memory:

1. With the 1-2-3 worksheet program displayed on the screen, type / (slash).
2. When you press the /, several 1-2-3 commands appear on both the second and third lines of the control panel. Move the pointer to the **File** command and press <Return>.
3. Now the second and third lines of the control panel are filled with different 1-2-3 commands. Move the pointer to the **Retrieve** command and press <Return>.
4. At the prompt to enter the file name, move the pointer to the file name, **SALES** and press <Return>. You should see the disk drive light come on momentarily on Drive B (or Drive A for hard disk configurations) as a copy of the worksheet is loaded from the disk to the 1-2-3 worksheet.

Your screen should now look like this:

G10: +G5+G6+G7+G8

	A	B	C	D	E	F	G
1	REGIONAL SALES ANALYSIS FOR 1985						
2							
3	PRODUCT	NORTH	EAST	SOUTH	WEST	TOTAL	%
4							
5	A	2000	4000	2000	4000	12000	30
6	B	3000	3000	2000	4000	12000	30
7	C	2000	3000	2000	3000	10000	25
8	D	1000	1000	2000	2000	6000	15
9							
10	TOTAL	8000	11000	8000	13000	40000	[100]

DO: CREATE A PIE CHART

Pie charts are about the easiest type of graph to create with the 1-2-3 Graph command.

Now that SALES is loaded into the 1-2-3 worksheet, we will make the totals for each region to be displayed in the form of a pie chart:

1. Press the / (slash) key to make the 1-2-3 commands appear on the screen.
2. Move the pointer to Graph and press <Return>.
3. Move the pointer to Type and press <Return>.
4. Move the pointer to Pie and press <Return>.
5. Move the pointer to to A and press <Return>. The A (or Y) range on a pie chart will indicate the set of values that 1-2-3 will represent as wedges of the pie. We will let the total sales for each region be each of the pie wedges.
6. Move the pointer to B10 and press . (period) and then move the pointer to E10 and press <Return>.
7. Now move the pointer to View and press <Return>. The pie chart is displayed on the screen. Notice there are no labels to indicate what each slice of the pie represents. Press <Space Bar> to return to the 1-2-3 worksheet screen.

8. Move the pointer to **X** and press **<Return>**. The **X** range on a pie chart will indicate the labels for each pie wedge.
9. Move the pointer to **B3** and press **.** (period) and then move the pointer to **E3** and press **<Return>**.
10. To put a title on the graph, move the pointer to **Options** and press **<Return>**.
11. Move the pointer to **Titles** and press **<Return>**.
12. Move the pointer to **First** and press **<Return>**. Type **REGIONAL SALES ANALYSIS FOR 1985** at the prompt and press **<Return>**.
13. Move the pointer to **Quit** and press **<Return>** to quit the graph options command.
14. Now move the pointer to **View** and press **<Return>**. The pie chart is displayed on the screen. Notice that labels to indicate what each slice of the pie represents and a graph title are now displayed. Press **<Space Bar>** to return to the 1-2-3 worksheet screen.
15. Move the pointer to **Quit** and press **<Return>** to quit graph processing.

DO: SHADING AND EXPLODING A PIE CHART

The graph specifications that we just entered are still stored with the worksheet specifications. In order to shade and explode the pie graph, we have to enter some special codes. The codes must be in a range that corresponds with the **A** (or value) range of the pie chart.

A number from 1 to 7 is entered to indicate the desired shading for each corresponding pie wedge. The codes 0 or 8 indicate an unshaded wedge.

Indicate the section or sections to be exploded by adding 100 to the corresponding shading code.

1. Move the pointer to **E4** and type 101. This will be the exploded wedge (Code 1 + 100 to indicate that it is exploded).
2. Move the pointer to **C4** and type 2.
3. Move the pointer to **D4** and type 3.

4. Move the pointer to **E4** and type **4** and press **<Return>**. We now have codes for each of the four regions displayed on the pie chart.
5. Press the **/** (slash) key to make the 1-2-3 commands appear on the screen.
6. Move the pointer to **Graph** and press **<Return>**.
7. Move the pointer to **B** and press **<Return>**.
8. Move the pointer to **B4** and press **.** (period) and then move the pointer to **E4** and press **<Return>**.
9. Now move the pointer to **View** and press **<Return>**. The pie chart is displayed on the screen. The wedges are shaded and the North wedge is exploded. Press **<Space Bar>** to return to the 1-2-3 worksheet screen.

DO: SAVING THE PIE CHART

To save the graph in a file for printing:

1. Move the pointer to **Save** and press **<Return>**.
2. At the prompt, type the file name, **SALESPIE**, and press **<Return>**.

DO: CLEAR THE GRAPH SPECIFICATIONS

1. To clear the graph specifications from memory, move the pointer to **Reset** and press **<Return>**.
2. Move the pointer to **Graph** to cancel all graph settings and press **<Return>**.
3. Move the pointer to **Quit** and press **<Return>** to quit graph processing.

DO: CREATING A BAR GRAPH

Simple bar charts are also easy graphs to create with the 1-2-3 Graph command.

Now that **SALES** is loaded into the 1-2-3 worksheet, we will make the totals for each region to be displayed in the form of a bar chart:

1. Press the / (slash) key to make the 1-2-3 commands appear on the screen.
2. Move the pointer to Graph and press <Return>.
3. Move the pointer to Type and press <Return>.
4. Move the pointer to Bar and press <Return>.
5. Move the pointer to X and press <Return>. The X range on a bar chart will indicate the labels for the points along the X (horizontal) axis.
6. Move the pointer to B3 and press . (period) and then move the pointer to E3 and press <Return>.
7. Move the pointer to A and press <Return>. The A (or Y) range on a bar chart will indicate the set of values that each bar will represent.
8. Move the pointer to B10 and press . (period) and then move the pointer to E10 and press <Return>.
9. Now move the pointer to View and press <Return>. The bar chart is displayed on the screen. Notice there are no labels to indicate what each axis of the bar chart represents. Press <Space Bar> to return to the 1-2-3 worksheet screen.
10. Move the pointer to Options and press <Return>.
11. Move the pointer to Titles and press <Return>.
12. Move the pointer to First and press <Return>. Type REGIONAL SALES ANALYSIS FOR 1985 at the prompt and press <Return>.
13. Move the pointer to Titles and press <Return>.
14. Move the pointer to X-Axis and press <Return>. Type REGION at the prompt and press <Return>.
15. Move the pointer to Titles and press <Return>.
16. Move the pointer to Y-Axis and press <Return>. Type SALES at the prompt and press <Return>.
17. Move the pointer to Quit and press <Return> to quit the graph options command.
18. Now move the pointer to View and press <Return>. The bar chart is displayed on the screen with a graph title and X and Y axis titles.

DO: SAVING THE GRAPH

To save the graph in a file for printing:

1. Move the pointer to **Save** and press **<Return>**.
2. At the prompt, type the file name, **SALESBAR**, and press **<Return>**.
3. Move the pointer to **Quit** and press **<Return>** to quit graph processing.
4. Now save the worksheet with the graph specifications by pressing the **/** (slash) key to invoke the 1-2-3 command menu.
5. Move the pointer to **File** and press **<Return>**, move the pointer to **Save** and press **<Return>**.
6. Press **<Return>** again at the prompt to enter the file name. Move the pointer to **Replace** to save the new version of the file and press **<Return>**.

DO: END 1-2-3 PROCESSING SESSION

In order to use the PrintGraph program you must end the 1-2-3 processing session and return to the Access System:

1. Press the **/** (slash) key.
2. Move the pointer to **Quit** and press **<Return>**.
3. Move the pointer to **Yes** and press **<Return>**.

You are now back to the Lotus Access System.

DO: PRINTING THE GRAPHS

To obtain a hard copy (print-out) of your completed bar graph, it is necessary to use the 1-2-3 PrintGraph program.

Be certain that your printer is powered on.

1. With the Access System menu on the screen, remove the 1-2-3 System Disk and replace with the 1-2-3 PrintGraph Disk. (If you are using a hard disk system with an installed version of 1-2-3, ignore this instruction.)
2. Move the pointer to **PrintGraph** and press **<Return>**.

3. Select the graph to be printed by moving the pointer to Image-Select and pressing <Return>.
4. Move the pointer to the picture, SALESPIE and press <Space Bar> to mark that graph for printing.
5. Then move the pointer to the picture, SALESBAR, and press <Space Bar> to mark that graph for printing and then press <Return> to select the marked pictures.
6. Make certain the printer is turned on and that the paper is properly positioned at the top of form.
7. Now move the pointer to Go and press <Return>. The printer should be printing a copy of your graph on the printer.

DO: END PRINTGRAPH PROCESSING SESSION

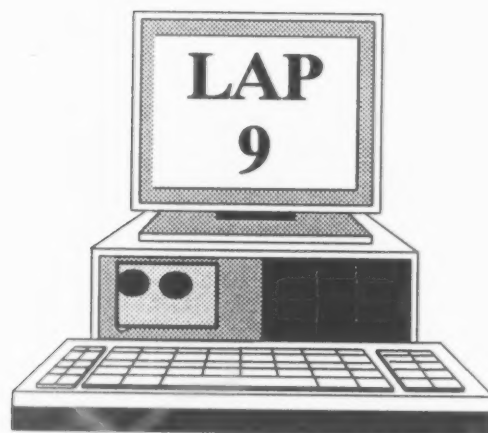
In order to use the PrintGraph program you must end the 1-2-3 processing session and return to the Access System:

1. Press the / (slash) key.
2. Move the pointer to Exit and press <Return>.
3. Move the pointer to Yes and press <Return>.

You are now back to the Lotus Access System. You may remove the Lotus PrintGraph Disk and your practice diskette from the diskette drives and power off the computer.

EXERCISES

- (1) Using the SALES worksheet, create and print a pie chart showing the percentage of sales for each product. Label each wedge of the pie using the product names: A, B, C, and D. Shade each wedge of the pie chart. Title the chart, PERCENTAGE OF SALES BY PRODUCT--1985.
- (2) Using the SALES worksheet, create and print a bar graph showing the percentage of sales for each product. The product names, A, B, C, and D, should be the labels along the horizontal axis. The Y range should be the percentage of sales for each product. Label the X-Axis as PRODUCT and the Y-Axis as PERCENTAGE OF SALES. Title the chart, PERCENTAGE OF SALES BY PRODUCT--1985.



LESSON 9

WRITING FORMULAS

OBJECTIVES:

- * Entering simple formulas
- * Define relative cell addresses
- * Copying a formula with relative cell addresses
- * Define absolute cell addresses
- * Copy a formula with absolute cell addresses
- * Explain the rules for arithmetic operations
- * Saving a worksheet and clearing the work area
- * Defining logical expressions, conditions, and operators
- * Defining compound logical expressions
- * Using logical expressions in a worksheet

REQUIRED MATERIALS:

- * Paper and pen or pencil
- * A DOS diskette
- * Lotus 1-2-3 System Disk
- * A practice disk
- * IBM-PC with 1 or 2 diskette drives or hard disk and printer

READ: FORMULA CALCULATION

If 1-2-3 did no more than record numbers and labels in a column-row structure, it would still be sitting on the shelf at your computer store. But it does much more than that. This unit will examine 1-2-3's single most powerful capability--formula calculation. This topic starts out simple but gets rather complex by its end. This reflects the fact that 1-2-3 is an extremely sophisticated tool in the hands of an experienced user.

DO: STARTING 1-2-3

Start 1-2-3 using the appropriate Lotus 1-2-3 Start-Up Procedure.

DO: ENTERING A SIMPLE FORMULA

In any cell you can enter a formula--an instruction for 1-2- 3 to calculate a number:

1. With the pointer on cell A1, type the value 23410.
2. Move the pointer to cell A2 and type 18500.
3. Move the pointer to cell A3 and type 22340.
4. Move the pointer to cell A4 and type 28850.
5. Move the pointer to cell A6. To show the sum of these figures in the worksheet you could enter a formula in cell A6:

23410+18500+22340+28850

However, there is a better way to enter this formula. Instead of telling 1-2-3 which numbers to add up, you can tell it where to find the numbers:

Type the formula, +A1+A2+A3+A4 and press <Return>. The result of the formula 93100 appears in cell A6.

READ: SOME RULES ABOUT FORMULAS

- o A formula, like a number, must begin with one of these characters:

0 1 2 3 4 5 6 7 8 9 0 . + (@ # \$

- o Formulas, like numbers, may not contain any space characters.

DO: ENTERING A SIMPLE FORMULA BY POINTING

1. Move the pointer to cell A6 and type + .
2. Move the pointer to cell A1 and type + .
3. Move the pointer to cell A2 and type + .
4. Move the pointer to cell A3 and type + .
5. Move the pointer to cell A4 and then press <Return>. The result of the formula, 93100, appears in cell A6.

READ: RELATIVE CELL ADDRESSES

The process of pointing to a cell indicates the positional relationships between the formula cell and the referenced cells--the cell whose values are used in the formula.

The reason to appreciate the positional relationships among the cells involved in a formula is because 1-2-3 itself remembers the formula in this way.

For instance, 1-2-3 does not record the formula in cell A6 as:

"the sum of the values in cells A1,A2,A3,and A4"

Rather, it records the formula as:

"the sum of: the value five cells above this one,
 the value four cells above this one,
 the value three cells above this one,
 the value two cells above this one."

This situation is described by saying that the formula involves relative cell addresses. Instead of remembering a cell address as a letter-number combination, 1-2-3 records the position of each referenced cell relative to the formula cell.

This relative way of representing formulas has a big payoff--you can use the very same formula at different locations in the worksheet to add different columns of numbers. In practice, you enter the formula just once, then use the /Copy command to copy it to other cells.

DO: COPYING A FORMULA WITH RELATIVE ADDRESSES--HORIZONTALLY

1. Move the pointer to cell B1, type the value 19877.
2. Move the pointer to cell B2 and type 18555.
3. Move the pointer to cell B3 and type 20034.
4. Move the pointer to cell B4 and type 29710.
5. Move the pointer to cell C1 and type 6544.
6. Move the pointer to cell C2 and type 7771.
7. Move the pointer to cell C3 and type 9819.
8. Move the pointer to cell C4 and type 6916.

9. To begin the /Copy command, move the pointer to cell A6 and press the / (slash). The command menus appear on the second and third lines of the control panel. Move the pointer to Copy and press <Return>.
10. Now press <Return> in response to the Copy From prompt since A6 is the source cell.
11. At the Copy To prompt move the pointer to cell B6 and press the . (period) to anchor cell B6 as the beginning of the target range.
12. Move the pointer to cell C6 and press <Return> to mark the end of the target range. The results of the formulas are displayed in cells B6 and C6.

This command copied the formula contained in cell A6 to cells B6 and C6 using relative cell addresses. Now the formula in B6 sums the numbers in column B and the formula in C6 sums the numbers in column C.

Your worksheet should look like the following:

B6: +B1+B2+B3+B4

	A	B	C	D	E	F	G	H
1	23410	19877	6544					
2	18500	18555	7771					
3	22340	20034	9819					
4	28850	29710	6916					
5								
6	93100	[88176]	31050					
7								
8								

13. Move the pointer to cell B6. You can observe on the first line of the control panel that this cell contains the copied formula: +B1+B2+B3+B4. Cell C6 contains the copied formula: +C1+C2+C3+C4.

DO: COPYING A FORMULA WITH RELATIVE ADDRESSES--VERTICALLY

Let's try summing these numbers again--only this time we will sum the rows instead of the columns.

1. Move the pointer to cell E1 and type the formula, +A1+B1+C1 and press <Return>.

2. To begin the /Copy command press the / (slash). The command menus appear on the second and third lines of the control panel. Move the pointer to Copy and press <Return>.
3. Now press <Return> in response to the Copy From prompt since E1 is the source cell.
4. At the Copy To prompt move the pointer to cell E2 and press the . (period) to anchor cell E2 as the beginning of the target range.
5. Move the pointer to cell E4 and press <Return> to mark the end of the target range. The results of the formulas are displayed in cells E2, E3, and E4.

This command copied the formula contained in cell E1 to cells E2, E3, and E4 using relative cell addresses. Now the formula in E2 sums the numbers in row 2, the formula in E3 sums the numbers in row 3, and the formula in E4 sums the numbers in row 4.

Your worksheet should look like the following:

E2: +A2+B2+C2

	A	B	C	D	E	F	G	H
1	23410	19877	6544		49831			
2	18500	18555	7771		[44826]			
3	22340	20034	9819		52193			
4	28850	29710	6916		65476			
5								
6	93100	88176	31050					
7								
8								

6. Move the pointer to cell E2. You can observe on the first line of the control panel that this cell contains the copied formula: +A2+B2+C2. Cell E3 contains the copied formula: +A3+B3+C3. Cell E4 contains the copied formula: +A4+B4+C4.

DO: SAVING THE WORKSHEET

This worksheet should be saved for future use:

1. Press the / (slash) to invoke the 1-2-3 command menus.

2. Move the pointer to **File** and press **<Return>** and then move the pointer to **Save** and press **<Return>**.
3. At the prompt to enter the file name, type **NUMBERS** (in upper or lower case) and press **<Return>**. You should see the disk drive light come on momentarily on Drive B as the worksheet is saved to the disk.

DO: PRINT THE WORKSHEET

Print the worksheet as follows:

1. Move the pointer to **A1** and press the **/** (slash) to invoke the 1-2-3 command menus.
2. Move the pointer to **Print** and press **<Return>** and then move the pointer to **Printer** and press **<Return>**.
3. Move the pointer to **Range** and press **<Return>**. With the pointer on cell **A1**, press the **.** (period) to anchor the pointer and then expand the pointer to **E6** and press **<Return>**.
4. Make certain the printer is powered on and at the top of the form.
5. Move the pointer to **Go** and press **<Return>**. The printer will print a copy of the worksheet.
6. Move the pointer to **Quit** and press **<Return>** to quit the Print commands menu.

DO: CLEAR THE WORKSHEET

You may clear the worksheet work area by entering another group of 1-2-3 commands:

1. Press the **/** (slash) to invoke the 1-2-3 command menus.
2. Move the pointer to **Worksheet** and press **<Return>**.
3. Move the pointer to **Erase** and press **<Return>**.
4. Move the pointer to **Yes** and press **<Return>**.

The worksheet work area is now clear for a new worksheet.

READ: ABSOLUTE CELL ADDRESSES

1-2-3 always assumes cell addresses contained in formulas to be relative unless you indicate otherwise. An absolute cell address will always refer to the same cell in the worksheet and is not affected by copying a formula. 1-2-3 uses the dollar sign (\$) to distinguish absolute cell addresses from relative cell addresses in formulas.

DO: COPYING A FORMULA USING ABSOLUTE CELL ADDRESSES

Let's build a worksheet that will calculate a discounted selling price based on an absolute discount factor:

1. Move the pointer to cell A1 and type "Discount.
2. Move the pointer to cell A2 and type .15.
3. Move the pointer to cell B1 and type "Cost.
4. Move the pointer to cell C1 and type "Price.
5. Move the pointer to cell B2 and type 75.
6. Move the pointer to cell B3 and type 105.
7. Move the pointer to cell B4 and type 227.
8. Move the pointer to cell B5 and type 199 and press <Return>.
9. The discounted price could be considered to be 85% (.85) of the cost since the discount factor is 15% (.15). So the discounted price is 85% (.85) of the cost. The formula for this calculation would be:

$$(1-\text{Discount Factor}) * \text{Cost}$$

Since the same discount factor .15 is used to convert all the values, why repeat it over and over by placing it in your formula? Instead, we place .15 in a single cell. That way if the discount factor ever changed all we would have to do is change the cell entry rather than changing the formula.

In this case the cell which contains the discount factor, A2, is an absolute cell reference and must be indicated as such in our formula.

Move the pointer to cell C2 and type, $(1-\$A\$2)*B2$, and press <Return>.

The dollar signs (\$) on each side of the A in the cell reference A2 indicate that A2 is absolute and should not be changed when the formula is copied.

10. To begin the /Copy command press the / (slash). The command menus appear on the second and third lines of the control panel. Move the pointer to Copy and press <Return>.
11. Now press <Return> in response to the Copy From prompt since C2 is the source cell.
12. At the Copy To prompt move the pointer to cell C3 and press the . (period) to anchor cell C3 as the beginning of the target range.
13. Move the pointer to cell C5 and press <Return> to mark the end of the target range. The results of the formulas are displayed in cells C3, C4, and C5.

This command copied the formula contained in cell C2 to cells C3, C4, and C5 using absolute and relative cell addresses. Now the formula in C3 calculates the discounted price based on the discount factor in A2 and the cost in row 3. The same is true for C4 and C5.

Your worksheet should look like the following:

C3: (1-\$A\$2)*B3

	A	B	C	D	E	F	G	H
1	Discount	Cost	Price					
2	.15	75	63.75					
3		105	89.25					
4		227	192.95					
5		199	169.15					
6								
7								
8								

14. Move the pointer to cell C3. You can observe on the first line of the control panel that this cell contains the copied formula: (1-\$A\$2)*B3. Cell C4 contains the copied formula: (1-\$A\$2)*B4. Cell C5 contains the copied formula: (1-\$A\$2)*B5.

DO: SAVING THE WORKSHEET

Save the worksheet using the /File Save command and name the worksheet file, DISCOUNT.

DO: PRINT THE WORKSHEET

Print the worksheet using the /Print Printer Range A1..C5 <Return> Go commands.

DO: CLEAR THE WORKSHEET

Use the /Worksheet Erase Yes command to clear the worksheet work area.

The worksheet work area is now clear for a new worksheet.

READ: PRINCIPLES OF ARITHMETIC OPERATIONS IN FORMULAS

This module has discussed the fact that you can indicate numbers for 1-2-3 to process in a formula either by typing or by pointing to cells. Let's consider some of the principles by which 1-2-3 operates in order to know what to do with the numbers.

Some of these considerations would include the description of the arithmetic operators used by 1-2-3 in formulas, the use of parentheses, negatives, and exponentiation in formulas, and the order or precedence in which operations are performed in a formula.

READ: USING OPERATORS IN FORMULAS

1-2-3 uses most of the familiar characters to indicate the arithmetic operations, except that it uses * (asterisk) for multiplication and / (slash) for division.

Since these characters indicate arithmetic operations, we call them operators:

+ addition - subtraction * multiplication / division

READ: PARENTHESES AND PRECEDENCE

In formulas the operations are performed from left to right. There are two ways to indicate that operations are to be performed in another order. One way is explicit--using

parentheses gives the enclosed section of the formula first priority.

+D7-(B7-C7) Take the difference between the values of B7 and C7 and then subtract this result from the value of D7.

+F50/(1+A3) Add 1 to the value of cell A3 and divide this result into the value of cell F50.

You can "nest" parentheses by using parentheses inside other parentheses.

Another way to alter the order of operations is by using precedence (order of operations). You may recall this idea from high-school algebra. (You did take high-school algebra, didn't you?!):

Multiplication and division are performed before addition and subtraction.

+G5+A7*100 Multiply the value of A7 by 100 and then add the result to the value of G5.

1+1/4 The number "one and a quarter."

READ: NEGATIVES AND PRECEDENCE

1-2-3 can handle negative numbers--numbers less than zero-- just as well as positive numbers. You indicate a negative number in a formula by starting it with a dash (-), the same characters used to indicate subtraction:

-3 minus 3

-50% minus 50 percent

You may also precede a cell address with a dash (-) to indicate that it is negative:

-F13 has the value, -34.7, if cell F13 contains 34.7

-F13 has the value, 150, if cell F13 contains -150

1-2-3 is smart enough to tell the difference between a "-" that indicates subtraction and a "-" that indicates a negative number:

+A15-450 "-" means subtraction

-C35*F1 "-" means negative

+X100--45 first "-" means subtraction, second "-" means negative

1-2-3 performs "take the negative" operations before the "subtract" operations in any formula. The principle may be stated like this:

Unless parentheses are used to override, "take the negative" is performed before "multiply" and "divide," which are performed before "add" and "subtract."

READ: EXPONENTIATION AND PRECEDENCE

The operation to "raise to the power," also called exponentiation, is performed before any other arithmetic operation. The ^ (caret) character indicates this operation:

+B35^5 the value in cell B35 raised to the fifth power

18*B35^5 raise the value in cell B35 to the fifth power and then multiply by 18

READ: ORDER OF PRECEDENCE

1-2-3 adopts the traditional mathematical method of assigning precedence of certain arithmetic operations over other arithmetic operations. This principle is:

Operations with higher precedence are performed first unless overridden by parentheses. Operations of equal precedence are performed from left to right.

The following table lists arithmetic operations by order of precedence from highest to lowest:

^	Exponentiation
-	Negative
* /	Multiplication and Division
+ -	Addition and Subtraction

Examples:

- +A4+100*A1 Multiply the value of A1 by 100 and then add the value of A4.
- +A1/12+C7/12 Add 1/12th the value of A1 to 1/12th the value of C7.
- +B25*C1^3 Raise the value of C1 to the third power and then multiply by the value of B25.

READ: LOGICAL OPERATORS AND EXPRESSIONS

Logical operations are operations that express relationships such as = (equal to), < (less than), > (greater than), and <> (not equal to). The formulas that we examined previously do arithmetic. They combine numbers using arithmetic operators, and produce numerical answers.

You can also use another type of formula, in which numbers are combined into a statement that is either TRUE or FALSE. Such formulas are called logical expressions or conditions. The operators that combine the numbers are called logical operators.

Here are some examples of formulas which are TRUE/FALSE statements:

- +C10=12 The value in cell C10 is equal to 12.
- +C10>=12 The value in cell C10 is greater than or equal to 12.
- +C10<>12 The value in cell C10 is not equal to 12.

Each of these statements has a TRUE or FALSE value. The result of a logical expression is always TRUE or FALSE. 1-2-3 defines TRUE and FALSE operationally:

- o If a statement is TRUE, it has the value 1. Conversely, any non-zero number is equivalent to TRUE.
- o If a statement is FALSE, it has the value 0.

In most situations you can think of the result of a 1-2-3 logical expression as TRUE or FALSE. But don't forget that these logical values are really numbers.

1-2-3 recognizes the following operators for making simple logical statements:

<u>Operator</u>	<u>Meaning</u>	<u>Precedence</u>
=	equal to	3
<	less than	3
<=	less than or equal to	3
>	greater than	3
>=	greater than or equal to	3
<>	not equal to	3

READ: COMPOUND STATEMENTS

In some situations, several conditions may apply at once. For instance:

- o Select records whose credit code is either 3 or 7.
- o Select records whose balances are greater than \$500 and are more than 60 days overdue.

You can build up compound conditions in logical expressions using several additional logical operators:

<u>Operator</u>	<u>Meaning</u>	<u>Precedence</u>
#NOT#	logical not	2
#AND#	logical and	1
#OR#	logical or	1

Note that these operators have lower precedence than the simple logical operators listed previously. Each of these begins and ends with the character # (pound sign). Some examples:

- #NOT#(C10=12) The value in cell C10 is not 12.
- +C10=12#OR#C10=24 The value in cell C10 is 12 or 24.
- +C10>12#AND#D10>24 The value in cell C10 is greater than 12 and the value in cell D10 is greater than 24.

Notice that when using compound conditions, the logical expression is stated completely on each side of the compound operator.

D0: USING LOGICAL EXPRESSIONS

Let's perform some simple operations that will demonstrate how logical expressions work. We will make several comparisons, and the results will always be returned in the form: 1=TRUE and 0=FALSE.

1. Move the pointer to A2 and type the following numbers in A2 through A4: 1 2 3
2. Move the pointer to B2 and type the following numbers in B2 through B4: 3 2 1

Your worksheet should look like the following:

B5:

	A	B	C	D	E	F	G	H
1								
2	1	3						
3	2	2						
4	3	1						
5	[	]						
6								

3. Move the pointer to C1 and type the label, "A > B .
4. Move the pointer to C2 and type the formula, +A2>B2 .
5. Use the /Copy command to copy the formula From C2 To C3..C4.

Your worksheet should look like the following:

C2: +A2>B2

	A	B	C	D	E	F	G	H
1			A > B					
2	1	3	[0]					
3	2	2	0					
4	3	1	1					
5								
6								

Remember that 0 means FALSE and 1 means TRUE. If two numbers are equal, then each is neither greater than nor less than the other.

6. Move the pointer to D1 and type the label, "A < B.
7. Move the pointer to D2 and type the formula, +A2<B2.
8. Use the /Copy command to copy the formula From D2 To D3..D4.

Your worksheet should look like the following:

D2: +A2<B2

	A	B	C	D	E	F	G	H
1			A > B	A < B				
2	1	3	0	[1]				
3	2	2	0	0				
4	3	1	1	0				
5								
6								

9. Move the pointer to E1 and type the label, "A = B.
10. Move the pointer to E2 and type the formula, +A2=B2.
11. Use the /Copy command to copy the formula From E2 To E3..E4.

Your worksheet should look like the following:

E2: +A2=B2

	A	B	C	D	E	F	G	H
1			A > B	A < B	A = B			
2	1	3	0	1	[0]			
3	2	2	0	0	1			
4	3	1	1	0	0			
5								
6								

DO: SAVING THE WORKSHEET

Save the worksheet using the /File Save command and name the worksheet file, LOGIC .

DO: PRINT THE WORKSHEET

Print the worksheet using the /Print Printer Range A1..E4
<Return> Go commands.

DO: CLEAR THE WORKSHEET

Use the /Worksheet Erase Yes command to clear the worksheet work area. The worksheet work area is now clear for a new worksheet.

READ: OPERATOR PRECEDENCE NUMBERS

The following is a complete table of precedence numbers:

<u>Operator</u>	<u>Meaning</u>	<u>Precedence Number</u>
^	Exponentiation	7
-	Negative	6
+	Positive	6
*	Multiplication	5
/	Division	5
+	Addition	4
-	Subtraction	4
=	Equal to	3
<	Less than	3
<=	Less than or Equal to	3
>	Greater than	3
>=	Greater than or Equal to	3
<>	Not equal to	3
#NOT#	Logical Not	2
#AND#	Logical And	1
#OR#	Logical Or	1

EXERCISES

- (1) Identify the following terms about cell formulas:
- (a) Formula _____
 - (b) Referenced Cell _____
 - (c) Relative _____
 - (d) Absolute Cell Reference _____

- (2) List the arithmetic operations in the order of precedence from highest to lowest:
- (a) _____
 - (b) _____
 - (c) _____
 - (d) _____
- (3) What are the results of the following formulas if cell A1=5, A2=3, A3=2, and A4=4:
- (a) $+A1*A3/A2$ _____
 - (b) $+A1-A2*A3$ _____
 - (c) $(A1-A2)*A3$ _____
 - (d) $+A4/A3+A1$ _____
 - (e) $+A1*A2^2$ _____
 - (f) $-A1*A3$ _____
 - (g) $+A1>A2+A3$ _____
 - (h) $+A1=A2+A3\#OR\#A1=A2+A4$ _____

(4) Write the 1-2-3 "take the negative" principle: _____

(5) Write the 1-2-3 "order of precedence" principle: _____

With the 1-2-3 program loaded into computer memory, DO the following operations and complete the question:

OPERATION 1:

Load the worksheet, NUMBERS, into the 1-2-3 work area:

1. Press the / key to invoke the 1-2-3 command menus.
2. Move the pointer to File and press <Return> and then move the pointer to Retrieve and press <Return>.
3. At the file name prompt, move the pointer to the file named NUMBERS and press <Return>. The worksheet should now appear on the display.

Copy a formula to cell E6 which will either sum the totals across row 6 (from C6..C6) or sum the totals in column E (from E4..E4).

What is the result of this formula? _____

Save the worksheet using the /File Save Replace procedure.

OPERATION 2:

Load the worksheet, DISCOUNT, into the 1-2-3 work area using the same /File Retrieve procedure as explained above. When a worksheet is loaded into the 1-2-3 work area and one is already present, the work area is cleared and the newly retrieved worksheet replaces the one that was there.

Enter a new column on this worksheet in column D. Name the column, Amount, in cell D1. In cell D2 enter a formula that will subtract the price from the cost.

What is the result of the formula in D2? _____

Now copy the formula from cell D2 to cells D3 through D5.

What is the result of the formula in D3? _____

in D4? _____

in D5? _____

Save the worksheet using the /File Save Replace procedure.

Now clear the work area using the /Worksheet Erase procedure.

OPERATION 3:

Load the worksheet, LOGIC, into the 1-2-3 work area using the same /File Retrieve procedure as explained above. When a worksheet is loaded into the 1-2-3 work area and one is already present, the work area is cleared and the newly retrieved worksheet replaces the one that was there.

Enter a new column on this worksheet in column F. Name the column, A<>B, in cell F1. In cell F2 enter a formula that will compare A2 and B2.

What is the result of the formula in F2? _____

Now copy the formula from cell F2 to cells F3 through F4.

What is the result of the formula in F3? _____

in F4? _____

Save the worksheet using the /File Save Replace procedure.

Now clear the work area using the /Worksheet Erase procedure.

CASE STUDY: ANNUITY CONTRIBUTION WORKSHEET

Create a worksheet that calculates the annuity amount to be deducted from each employee's gross pay. Employees contribute 12% of their gross pay to an annuity program.

Your worksheet should be organized like the following:

	A	B	C	D	E	F	G	H
1	Annuity Contribution Worksheet							
2	Rate	.12						
3								
4	Employee	Gross	Annuity	Net				
5	Name	Pay	Amount	Pay				
6								
7	Jones, J.	250						
8	Brown, C.	280						
9	Smith, N.	150						
10	Green, A.	200						
11	King, B.	400						
12								
13	TOTALS							
14								

- (A) Write a formula in cell C7 which will calculate the annuity amount to be deducted from Jones, J. Gross Pay.

What is this formula? _____

Now copy this formula to calculate the annuity amount to be deducted for all employees.

- (B) Write a formula in cell D7 which will calculate the Net Pay after the Annuity Amount has been deducted from the Gross Pay.

What is this formula? _____

Now copy the formula to calculate the Net Pay for all employees.

- (C) Write a formula in cell B13 which will sum the Gross Pay for all employees.

What is this formula? _____

Now copy the formula to sum Annuity Amount and Net Pay columns of the worksheet.

Save the worksheet as ANNUITY using the /File Save procedure.

WRITING FORMULAS 9-20

Use the /Print Printer procedure to obtain a hard copy of your worksheet.

- (D) Tax regulations have determined that you cannot contribute more than \$2000 a year to the annuity program. Therefore, create another column on the worksheet named, Over 2000.

Your worksheet should be organized like the following:

	A	B	C	D	E	F	G	H
1	Annuity Contribution Worksheet							
2	Rate	.12						
3								
4	Employee	Gross	Annuity	Net	Over			
5	Name	Pay	Amount	Pay	2000			
6								
7	Jones, J.	250						
8	Brown, C.	280						
9	Smith, N.	150						
10	Green, A.	200						
11	King, B.	400						
12								
13	TOTALS							
14								

Write a formula in cell E7 using a compound logical expression that will determine if the annuity amount contributed in one year (52 weeks) will exceed 2000 and display 1 for TRUE or 0 for FALSE. Your formula should work something like this:

Annuity Amount X 52 Is Greater Than 2000

What is this formula? _____

Now copy the formula to calculate the Over 2000 for all employees.

Which employees will exceed the 2000? _____

Save the worksheet as ANNUITY using the /File Save procedure.

Use the /Print Printer procedure to obtain a hard copy of your worksheet.

CASE STUDY: SOFTRIGHT SOFTWARE SALES

You have just been hired as the sales manager for the Softright Software Company. Your first task is to prepare a monthly sales commission report summarizing last month's sales for the four sales areas on the sales force. You are given the following information:

- o The company sells two products: SoftBase and SoftWord. SoftBase is an Information Management Program that sells for \$395.00. SoftWord is a Word Processing Program that sells for \$295.00.
- o Designate the four sales areas as Area 1, Area 2, Area 3, and Area 4.
- o Commissions are paid at a rate of 3 percent for dollar sales above \$200,000.

In your desk you find a copy of a sales report that was prepared by your predecessor. It reads as follows:

	Area 1	Area 2	Area 3	Area 4
Sales of SoftBase (units)	1200	380	450	1400
Selling Price of SoftBase	395	395	395	395
Sales of SoftWord (units)	1100	380	800	400
Selling Price of SoftWord	295	295	295	295

- (A) Create a worksheet to calculate total revenues and sales commissions using the sales information from the copy of the sales report prepared by your predecessor. Your worksheet should look something like the following example:

SOFTRIGHT SOFTWARE SALES

	Area 1	Area 2	Area 3	Area 4
Sales of SoftBase (units)	1200	380	450	1400
Selling Price of SoftBase	395	395	395	395
Revenue from SoftBase	_____	_____	_____	_____
Sales of SoftWord (units)	1100	380	800	400
Selling Price of SoftWord	295	295	295	295
Revenue from SoftWord	_____	_____	_____	_____
Total Sales Revenue	_____	_____	_____	_____
Sales Commission	_____	_____	_____	_____

WRITING FORMULAS 9-22

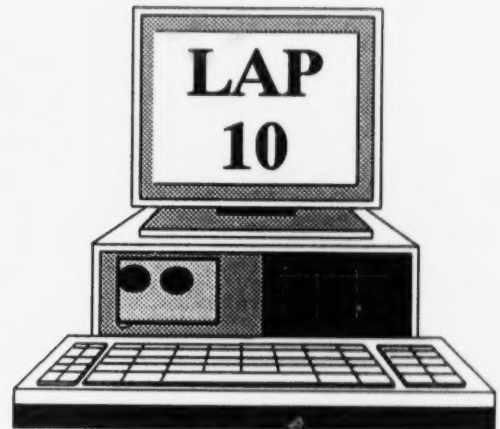
Save the worksheet as SOFTRIGHT using the /File Save procedure.

Use the /Print Printer procedure to obtain a hard copy of your worksheet.

- (B) During the current month their sales of SoftBase were 750, 600, 900, and 1100 units. Sales of SoftWord were 800, 210, 900, and 1800 units. Modify the worksheet using these amounts.

Save the worksheet as SOFTRIGHT using the /File Save procedure.

Use the /Print Printer procedure to obtain a hard copy of your worksheet.



LESSON 10

1-2-3 FUNCTIONS

OBJECTIVES:

- * Defining a function
- * How to type and use functions
- * List common 1-2-3 functions
- * Using functions in a worksheet
- * Explain calendar arithmetic functions
- * List date and time functions
- * Performing calendar arithmetic functions in a worksheet
- * Using numeric display format for dates in a worksheet
- * Saving and printing a worksheet
- * Identify logical functions and syntax
- * Use a logical function in a worksheet

REQUIRED MATERIALS:

- * Paper and pen or pencil
- * A DOS diskette
- * Lotus 1-2-3 System Disk
- * A practice disk
- * IBM-PC with 1 or 2 diskette drives or hard disk and printer

READ: WHAT IS A FUNCTION?

You can think of functions as "built-in" formulas. Like formulas, a function has a numeric or logical value or a value of ERR (indicates Error) or NA (indicates Not Available). This value usually depends on its arguments--numbers, cell or range references, or even other functions.

Functions are used by typing the function name followed by its arguments, if any. The function name always begins with an @ character. The rest of the name can be typed in upper or lower case or any combination of upper and lower case characters. The arguments follow the name in parentheses, separated by commas:

@function(argument1,argument2,...argumentN)

Depending on the function, an argument can be either a single value or a range. If a function requires:

	<u>Single Value</u>	<u>Range</u>
Allowable arguments:	number cell-addr function one-cell range name formula	cell address..cell address range name

For a function to work, there must be the correct number of arguments, in the correct order, and of the correct type, either a single value or a range. You can specify cell and range references either by pointing or by typing.

Some functions such as @ERR do not take an argument. Other functions may take a variety of arguments.

READ: USING 1-2-3 FUNCTIONS

Using a function tells 1-2-3, "Here are some numbers. Go off and do some figuring. Then take the answer you get and use it in the formula here."

In a sense a function is a formula within a formula. This makes 1-2-3 a very powerful tool, but as always, greater sophistication means greater complexity and a greater possibility of confusion and error.

READ: WHAT DOES A FUNCTION LOOK LIKE?

1-2-3 needs to know what particular "figuring" you want it to do, and what particular numbers to use. Here are some examples of functions:

@SUM(A1..A5)	@AVG(B2..B10)
@MAX(C2..H2)	@COUNT(DATA_VALUES)

These examples illustrate some important facts about functions:

- o Each function has a name that starts with the character "@".
- o A function begins with the function name.

- o Following the function name, you indicate the numbers for 1-2-3 to combine to produce the result of the function or value. These are the arguments to the function. The entire set of arguments is enclosed in parentheses. Individual arguments are separated by commas.
- o Some functions allow you to specify a cell range as an argument. 1-2-3 then uses all the numbers stored in the range as arguments to the function. Each function has its own rules as to whether it can process a range of values, and if so, what it does with the values.

READ: WHERE ARE FUNCTIONS USED?

Functions may be used anywhere that you could use a number in a cell entry, either alone or as part of a formula. For example, if the sum of the numbers in cells A12..A25 is 176.99 then:

Alone: @SUM(A12..A25) is equivalent to the number 176.99

In a formula: 3*@SUM(A12..A25) is equivalent to the formula 3*176.99

READ: FUNCTIONS INSIDE FUNCTIONS

Consider these two facts:

- o You can use a function instead of a number anywhere in a cell entry.
- o Many of the arguments to be specified in a function are numbers.

Taken together, these facts imply that you can use one function inside another function. It can get as complex as your sense of logic allows.

For instance, using the logical function @IF:

@IF(F13>20,100,55)

and then

Substitute the function @MAX(A1..A5) for 100, and

Substitute the function @HLOOKUP(B1,B5..B10,1) for 55,

becomes,

`@IF(F13>20,@MAX(A1..A5),@HLOOKUP(B1,B5..B10,1))`, and then

Substitute the function `@ABS(A17)` for B1

becomes

`@IF(F13>20,@MAX(A1..A5),@HLOOKUP(@ABS(A17),B5..B10,1))` .

You will probably give up before 1-2-3 does. If you make a mistake in your formula, such as not having matching right and left parentheses, 1-2-3 will reject your formula and automatically place you in EDIT mode and put the cursor under the part of the formula it does not understand.

READ: SOME USEFUL 1-2-3 FUNCTIONS

The following list describes some of the more common 1-2-3 functions. It is by no means a complete list of all the 1-2-3 functions. However, these are some functions for which you might have need in completing this and other units.

The function is named first with the syntax for using the function immediately following. Then a description of the function and a further explanation of the syntax follows.

- | | |
|---------------------------|--|
| <code>@ABS(x)</code> | The value of the function returns the absolute, or positive, value of x. |
| <code>@AVG(list)</code> | The value of the function is the average of all items in the list. The equivalent of the <code>@AVG(list)</code> is <code>@SUM(list)</code> divided by <code>@COUNT(list)</code> . If the argument list contains no items, the result is ERR. If the list includes a range, then <code>@AVG</code> ignores blank cells within the range. |
| <code>@COUNT(list)</code> | The value of the function is the number of items in the list. If the list includes a range, then <code>@COUNT</code> counts all the non-blank cells with the range. All single value arguments count as 1 each, even a single cell reference to a blank cell. |
| <code>@INT(x)</code> | The value of the function is the integer portion of x. |
| <code>@MAX(list)</code> | The result of the function is the maximum of the values of all the entries in the list. If there are no entries in the list, the function returns the result ERR. If a range is included in the list, blank cells in the range are ignored. |

@MIN(list) The result of the function is the minimum of the values of all the entries in the list. If there are no entries in the list, the function returns the result ERR. If a range is included in the list, blank cells in the range are ignored.

@PMT(principal, interest, n)
The @PMT function calculates the mortgage payment per period for a given principal, interest rate per period, and number of periods (n).

@ROUND(x, ndigits)
The result of the function is the first argument, rounded to the number of digits specified by the second argument, ndigits. The second argument is converted to an integer and must be in the range from -15 to +15 inclusive. If ndigits is zero, then x is rounded to an integer.

@SUM(list) The result of the function is the sum of the values of all cells in the list. Blank cells in the range references are ignored.

DO: STARTING 1-2-3

Start 1-2-3 using the appropriate Lotus 1-2-3 Start-Up Procedure.

DO: LOAD THE SALES WORKSHEET

We are going to use a previously completed worksheet to demonstrate the how to use a very important function, @SUM. The @SUM function will total a range of numbers.

To load the worksheet, SALES:

1. Press the / (slash) to invoke the 1-2-3 command menu.
2. Move the pointer to the File command and press <Return> and then move the pointer to the Retrieve command and press <Return>.
3. At the prompt to enter a file name, either move the pointer to the file named SALES and press <Return> or type in the file name, SALES, at the prompt and press <Return>.

Your worksheet should look like this on the screen:

G10: +G5+G6+G7+G8

	A	B	C	D	E	F	G
1	REGIONAL SALES ANALYSIS FOR 1985						
2							
3	PRODUCT	NORTH	EAST	SOUTH	WEST	TOTAL	%
4							
5	A	2000	4000	2000	4000	12000	30
6	B	3000	3000	2000	4000	12000	30
7	C	2000	3000	2000	3000	10000	25
8	D	1000	1000	2000	2000	6000	15
9							
10	TOTAL	8000	11000	8000	13000	40000	[100]

DO: USING THE @SUM FUNCTION

Previously, when you completed this worksheet, you calculated the totals by literally summing all the cells in a row or column. For example, the formula for cell G10 is +G5+G6+G7+G8.

Now that you know about functions you could use the @SUM function to perform this operation in a simpler and more concise manner:

1. Let's work from left to right. Move the pointer to cell B10 and type the beginning of the formula, @SUM(, then move the pointer to cell B5, press period to anchor the beginning of the range, move the pointer to cell B8, and then close the parentheses by typing) and pressing <Return>.

Your completed formula should say, @SUM(B5..B8).

2. Now copy the formula to the other cells in the TOTAL row using relative cell addresses. Begin with the pointer on cell B10 (always begin a /Copy with the pointer at the beginning of the range which you are Copying From).
3. To begin the /Copy command, press the / (slash) to invoke the 1-2-3 command menu. Move the pointer to Copy and press <Return>.
4. Now press <Return> in response to the Copy From prompt since B10 is the source cell.
5. At the Copy To prompt move the pointer to cell C10 and press the . (period) to anchor cell C10 as the beginning of the target range.

6. Expand the pointer to cell G10 and press <Return> to mark the end of the target range. The results of the formulas are displayed in the cells on the TOTAL row.
7. Move the pointer to each of the cells (B10 through G10) to see that the @SUM function has replaced the former calculation. The results in the cells should be the same as they were previously.

DO: REPLACING THE WORKSHEET WITH THE NEW FORMULAS

Now save the worksheet with the new formulas and replace the former worksheet:

1. With the pointer at any cell location, type / .
2. Move the pointer to the File command on the command menu and press <Return>.
3. Move the pointer to the Save command on the command menu and press <Return>.
4. Type the file name, SALES, or press <Return>.
5. At the next prompt move the pointer to the Replace command and press <Return>. You should see the disk drive light on Drive B (or Drive A for hard disks) come on momentarily as the old version of the file is replaced with the new version.

DO: CLEAR THE WORKSHEET

You may clear the worksheet work area by using the /Worksheet Erase command:

1. Press the / to invoke the 1-2-3 command menus.
2. Move the pointer to Worksheet and press <Return> .
3. Move the pointer to Erase and press <Return> .
4. Move the pointer to Yes and press <Return> .

The worksheet work area is now clear for a new worksheet.

DO: USING THE @COUNT FUNCTION

The @COUNT function will count the number of items in a range of cells:

1. Beginning at cell A1, type in the following numbers in cells A1 through A10:

250 370 400 180 960 120 880 560 320 700

Your worksheet should look like this on the screen:

A10: +700

	A	B	C	D	E	F	G
1	250						
2	370						
3	400						
4	180						
5	960						
6	120						
7	880						
8	560						
9	320						
10	[700]						

2. Move the pointer to B1 and type, "COUNT .
3. Move the pointer to C1 and type, @COUNT(. Move the pointer to A1, press . (period), and then move the pointer to A10, type) (closing parenthesis) , and press <Return>.

The number 10 should be displayed in C1 telling you that there are 10 items in that specified range.

Your worksheet should look like this on the screen:

C1: @COUNT(A1..A10)

	A	B	C	D	E	F	G
1	250	COUNT [	10]				
2	370						
3	400						
4	180						
5	960						
6	120						
7	880						
8	560						
9	320						
10	700						

DO: USING THE @MAX FUNCTION

The @MAX function will find the largest value in a range of numbers:

1. Move the pointer to B2 and type, "MAXIMUM .
2. Move the pointer to C2 and type, @MAX(. Move the pointer to A1, press . (period), and then move the pointer to A10, type) , and press <Return> .

The number 960 should be displayed in C2 telling you that 960 is the largest number in that specified range.

Your worksheet should look like this on the screen:

C2: @MAX(A1..A10)

	A	B	C	D	E	F	G
1	250	COUNT	10				
2	370	MAXIMUM [	960]				
3	400						
4	180						
5	960						
6	120						
7	880						
8	560						
9	320						
10	700						

DO: USING THE @MIN FUNCTION

The @MIN function will find the smallest value in a range of numbers:

1. Move the pointer to B3 and type, "MINIMUM.
2. Move the pointer to C3 and type, @MIN(. Move the pointer to A1, press . (period), and then move the pointer to A10, type) , and press <Return>.

The number 120 should be displayed in C3 telling you that 120 is the smallest number in that specified range.

Your worksheet should look like this on the screen:

C3: @MIN(A1..A10)

	A	B	C	D	E	F	G
1	250	COUNT	10				
2	370	MAXIMUM	960				
3	400	MINIMUM	[120]				
4	180						
5	960						
6	120						
7	880						
8	560						
9	320						
10	700						

DO: USING THE @AVG FUNCTION

The @AVG function will find the average of a range of numbers:

1. Move the pointer to B4 and type, "AVERAGE.
2. Move the pointer to C4 and type, @AVG(. Move the pointer to A1, press . (period), and then move the pointer to A10, type) , and press <Return>.

The number 474 should be displayed in C4 telling you that 474 is the average of that specified range.

Your worksheet should look like this on the screen:

C3: @AVG(A1..A10)

	A	B	C	D	E	F	G
1	250	COUNT	10				
2	370	MAXIMUM	960				
3	400	MINIMUM	120				
4	180	AVERAGE	[474]				
5	960						
6	120						
7	880						
8	560						
9	320						
10	700						

READ: CALENDAR ARITHMETIC FUNCTIONS

There are a group of @functions that allow you to do calendar arithmetic. With calendar arithmetic, you don't type dates as label entries, such as "10-13-85." Instead, you use serial numbers to represent dates:

<u>Serial Number</u>	<u>Date</u>
1	January 1, 1900
2	January 2, 1900
.	
.	
367	January 1, 1901
.	
.	
36526	January 1, 2000
.	
.	
72685	January 1, 2099
.	
.	
73049	December 31, 2099

This strategy makes it easy for you to use 1-2-3's calculation ability in carrying out many date-related analyses:

- o Tickler Files
- o Weekly Schedules
- o Gantt Charts
- o Aging Reports
- o Day-by-day and Month-by-month Planning

However, feel free to ignore 1-2-3's date calculation capability. For many purposes you may want to enter the date for a point of reference or identification. In this case it may be entered as a label. But when it becomes necessary to perform some calculation using the date, then the date-calculation capability should be incorporated into your cell entry for that date.

READ: ADVANTAGES OF ENTERING DATES AS NUMBERS

o Consistency and Flexibility

1-2-3 has three different numeric display formats that make date serial numbers really look like dates:

13-Oct-85 13-Oct Oct-13

1-2-3 takes care of making entire sets of dates look consistent. And you can switch back and forth among these display formats without having to reenter the dates.

o Calculations

There is no way for 1-2-3 to know that there are 482 days between 5-8-83 and 9-1-84. But if these dates are represented by numbers (30444 and 30926, respectively), then the answer is a simple subtraction: $30926 - 30444 = 482$. You can quickly construct a complete calendar, using a few simple formulas.

In the /Data Query command you can search for a particular date whether it is represented as a number or a label. But you can specify conditions such as "before today" and "all Tuesdays from March to September of next year" only if you use calendar arithmetic.

READ: THE DATE FUNCTIONS

Two of the date functions answer the question, "What is the serial number?" for a particular date.

The function is named first with the syntax for using the function immediately following. Then a description of the function and a further explanation of the syntax follows.

@DATE(year,month,day)

Calculates the number (1-73049) corresponding to a particular day between January 1, 1900, and December 31, 2099.

@DATEVALUE(date string)

Returns the serial date number of the string value stating the year, month, and day using one of the 1- 2-3 date formats: DD-MMM-YY, DD-MMM with the current year automatically included, MMM-YY with the date stored as the first of the month, or DD/MM/YY.

@NOW Returns the serial number for the current date and time. This includes both a date number (integer part) and a time number (fractional or decimal part). For example, @NOW = 31048.5 at noon on January 25, 1985. @INT(@NOW) = 31048 at the same time.

Several other @functions perform an opposite operation--they allow you to reconstruct a date from its particular serial number:

@YEAR(serial#) Calculates the number of years since 1900 (0-199) for the date with the given serial number.

@MONTH(serial#) Calculates the month (1-12) for the date with the given serial number.

@DAY(serial#) Calculates the day-of-month (1-31) for the date with the given serial number.

Several time functions are included in Release 2 of 1-2-3:

@TIME(hr,min,sec) Returns the serial time number of hr, min, and sec for 0 is the beginning of a day and 1 is the end of a day.

@HOUR(time number) Extracts the hour value from a time number and returns a value between 0 (midnight) and 23 (11:00 PM).

@MINUTE(time number) Extracts the minute value from a time number and returns a value between 0 and 59.

@SECOND(time number) Extracts the second value from a time number and returns a value between 0 and 59.

@TIMEVALUE(time string) Returns the serial time number from the string value stating the hour, minute and second. Time string must be in one of the following formats: HH:MM:SS AM/PM or HH:MM AM/PM.

READ: PERFORMING CALENDAR ARITHMETIC CALCULATIONS

Here are some tips for performing calculations with date serial numbers:

- o Calculate the number of days between two dates by subtracting serial numbers: later date - earlier date.

- o To generate a calendar, use such formulas as:

+A15 + 1 to generate the next day's date

+A15 + 7 to generate the same day next week

Don't use "plus 31" or "plus 365" formulas to go from month to month or year to year since months and years are not all the same length!

- o Given the number of days between two dates, calculate the number of weeks by dividing by 7. Use the @INT or @ROUND function to convert the result to a whole number.
- o When the exact number of days in an interval is critical, decide whether the interval should include both the starting and ending dates, just one of those dates, or neither. A straightforward subtraction includes one of the end dates.
- o Bankers often simplify things by assuming the months have 30 days and years have 360 days. To calculate in this manner, don't compute an interval in days. Instead, use the @YEAR and @MONTH functions to calculate the interval in years and months. Then multiply by the 360 and 30 factors to obtain the days equivalent.
- o Date functions may be used in logical expressions.

DO: CLEAR THE WORK AREA

If the work area is not clear from the previous operation then use the /Worksheet Erase Yes command to clear the work area.

DO: PERFORMING CALENDAR ARITHMETIC CALCULATIONS

Let's create a simple worksheet that will tell you how many days, months, and years old you are from today's date:

1. Move the pointer to cell A1 and type the label, **BIRTHDAY ANALYSIS WORKSHEET**.

2. Move the pointer to cell A3 and type the label, **Today's Date:** .
3. Move the pointer to cell A4 and type the label, **My Birthday:** .
4. Move the pointer to cell A6 and type the label, **Age in Years:** .
5. Move the pointer to cell A7 and type the label, **Age in Months:** .
6. Move the pointer to cell A8 and type the label, **Age in Days:** and press <Return>.

Your worksheet should look like this at this point:

A7: 'Age in Days:

	A	B	C	D	E	F	G
1	BIRTHDAY ANALYSIS WORKSHEET						
2							
3	Today's Date:						
4	My Birthday:						
5							
6	Age in Years:						
7	Age in Months:						
8	[Age in Days:]						
9							
10							

7. Move the pointer to cell C3 and type the formula, **@INT(@NOW)** to return the system date without the time value. (You should have entered the system date when you started 1-2-3.)
8. Move the pointer to cell C4 and type your birthday using the format, **@DATE(year,month,day)**. For example, if your birthday were October 13, 1953, you would type, **@DATE(53,10,13)**.
9. Move the pointer to cell C6 and calculate the age in years by typing the formula, **@YEAR(C3-C4)**.

10. Move the pointer to cell C7. To calculate the age in months, you could multiply the number of years by 12 and subtract the number of months from the month in the year in which you were born and add the number of months to the month in the current year.

Type the formula like this:

`@YEAR(C3-C4)*12+@MONTH(C3-C4)`

Remember, the @MONTH function returns the numeric value of the month (1-12) for a specified serial number.

11. Move the pointer to cell C8 and calculate the age in days by merely subtracting your birthdate from today's date. Type the formula, `+C3-C4`, and press <Return>.

Your worksheet should look something like this, depending on the dates you used:

C8: `+C3-C4`

	A	B	C	D	E	F	G
1	BIRTHDAY ANALYSIS WORKSHEET						
2							
3		Today's Date:	31573				
4		My Birthday:	19645				
5							
6		Age in Years:	32				
7		Age in Months:	380				
8		Age in Days:	11928				
9							
10							

DO: USING A NUMERIC DISPLAY FORMAT FOR DATES

Wouldn't the dates in C3 and C4 be more meaningful if they were displayed in the form, 10-Jun-86 and 13-Oct-53, respectively? We can perform this operation using 1-2-3 display format commands.

Since this date format would require a greater column-width than what is already there, we first need to increase the column-width of column C:

1. Move the pointer to any row in column C and press / .

2. Move the pointer to the **Worksheet** command and press <Return>.
3. Move the pointer to the **Column** command and press <Return>.
4. Move the pointer to the **Set Width** command and press <Return>.
5. At the prompt for the column width, type 10 over the top of whatever number is there and press <Return>.

Now we need to set the display format for cells C3 and C4 to a date format. This is a Range command.

6. Move the pointer to cell C3 and press / .
7. Move the pointer to the **Range** command and press <Return>.
8. Move the pointer to the **Format** command and press <Return>.
9. Move the pointer to the **Date** command and press <Return>.
10. Move the pointer to date format number one which is (DD-MMM-YY) and press <Return>.
11. At the range to format prompt, expand the pointer to cover C3 and C4 and then press <Return>.

Your formatted worksheet should look something like this, depending on the dates you used:

C3: @INT(@NOW)

	A	B	C	D	E	F	G
1	BIRTHDAY ANALYSIS WORKSHEET						
2							
3	Today's Date:		[10-Jun-86]				
4	My Birthday:		13-Oct-53				
5							
6	Age in Years:		32				
7	Age in Months:		380				
8	Age in Days:		11928				
9							
10							

DO: SAVE THE WORKSHEET

Save the worksheet using the /File Save command and name the worksheet, BIRTHDAY.

DO: PRINT THE WORKSHEET

Print the worksheet using the /Print Printer Range A1..C8 <Return> Go commands.

READ: 1-2-3 LOGICAL FUNCTIONS

Logical functions produce values based on the results of conditional statements. A conditional statement evaluates a condition in the form of an equation, The condition is either true or false.

ERR and NA are special values in 1-2-3 generated either by 1-2-3 or by you. ERR denotes an error in a formula, and NA denotes that a number needed to complete a formula is not available. Any formula that is dependent upon a formula containing ERR or NA will also result in ERR or NA. ERR and NA are both numeric values. A blank cell has a numeric value of zero.

READ: 1-2-3 LOGICAL FUNCTION LIST

The following list is some 1-2-3 logical functions which you need to know in completing this and other units in this instructional area.

The function and the proper syntax for using the function is followed by an explanation of the function and syntax:

@IF(a,true,false)

This function tests the first argument, a, for non-zero (TRUE) or zero (FALSE). IF TRUE, the true expression is performed. IF FALSE, the false expression is performed.

Example: @IF(C1>C2,E1-E2,E2-E1)

E2 is subtracted from E1 if the value in cell C1 is greater than the value in C2. Otherwise E1 is subtracted from E2.

@ISERR(x)

The value of the function is TRUE (1.0) if x = ERR. Otherwise the value of the function is FALSE (0.0).

Example: @ISERR(C1)

1 if the value of cell C1 is ERR. 0 if the value of cell C1 is not ERR.

@ISNA(x)

The value of the functions is TRUE (1.0) is x = NA (not available). Otherwise the value of the function is FALSE (0.0).

Example: @ISNA(C1)

1 if the value of cell C1 is NA. 0 if the value of cell C1 is not NA.

DO: LOAD THE WORKSHEET

We are going back to the SALES worksheet to demonstrate the use of the logical function @IF.

Use the /File Retrieve command to load the worksheet, SALES.

Your worksheet should look like this on the screen:

G10: @SUM(G5..G8)

	A	B	C	D	E	F	G
1	REGIONAL SALES ANALYSIS FOR 1985						
2							
3	PRODUCT	NORTH	EAST	SOUTH	WEST	TOTAL	%
4							
5	A	2000	4000	2000	4000	12000	30
6	B	3000	3000	2000	4000	12000	30
7	C	2000	3000	2000	3000	10000	25
8	D	1000	1000	2000	2000	6000	15
9							
10	TOTAL	8000	11000	8000	13000	40000	[100]

DO: USING THE @IF FUNCTION

We are going to add another row of calculations to this worksheet for Bonus. Bonus will be calculated by region. If the total sales for a region reaches 10000 or greater, the bonus rate is 12%. If the total sales is less than 10000, the bonus rate is 18%. This can be expressed as a logical formula:

1. Move the pointer to cell A12 and type, BONUS.
2. Move the pointer to cell B12 and type the logical formula to calculate the bonus amount:

`@IF(B10<10000,B10*.12,B10*.18)`

and press <Return>.

This formula says that IF the value in cell B10 is less than 10000, THEN multiply the value in cell B10 by .12, ELSE multiply the value in cell B10 by .18.

When using the @IF function, the commas in the expression can be thought of as meaning THEN and ELSE, respectively. An @IF expression will always be arranged as IF...THEN...ELSE.

3. Now copy the formula across the row for all regions (don't include Total and % columns). Begin with the pointer on cell B12 (always begin a /Copy with the pointer at the beginning of the range which you are Copying From).
4. To begin the /Copy command, press the / to invoke the 1-2-3 command menu. Move the pointer to Copy and press <Return>.
5. Now press <Return> in response to the Copy From prompt since B12 is the source cell.
6. At the Copy To prompt move the pointer to cell C12 and press the . (period) to anchor cell C12 as the beginning of the target range.
7. Expand the pointer to cell E12 and press <Return> to mark the end of the target range. The results of the formulas are displayed in the cells on the BONUS row.

The logical formula used cell addresses relative to the row and column in which each formula is located. Move the pointer to check these formulas.

Your worksheet should look like this on the screen:

B12: @IF(B10<10000,B10*.12,B10*.18)

	A	B	C	D	E	F	G
1	REGIONAL SALES ANALYSIS FOR 1985						
2							
3	PRODUCT	NORTH	EAST	SOUTH	WEST	TOTAL	%
4							
5	A	2000	4000	2000	4000	12000	30
6	B	3000	3000	2000	4000	12000	30
7	C	2000	3000	2000	3000	10000	25
8	D	1000	1000	2000	2000	6000	15
9							
10	TOTAL	8000	11000	8000	13000	40000	100
11							
12	BONUS	[960]	1980	960	2340		

DO: SAVE THE WORKSHEET

Replace the worksheet with these changes using the /File Save command and the file name, SALES.

DO: PRINT THE WORKSHEET

Print the worksheet using the /Print Printer RangeA1..G12
<Return> Go commands.

EXERCISES

- (1) Create a worksheet using the @AVG function that averages grades by student and by grade using the following information:

Mrs. Compton's Computer Class

Student	Grade 1	Grade 2	Grade 3	Grade 4	Average
B.Brown	80	75	75	90	—
E.Evans	90	85	88	85	—
G.Green	62	73	91	74	—
S.Smith	98	93	76	97	—
T.Taylor	100	87	91	94	—
W.White	80	73	65	82	—
Averages	—	—	—	—	—

You should enter this worksheet and calculate the average for the corresponding row or column at each underscore.

Save the worksheet as COMPTON using the /File Save command.

Use the /Print Printer procedure to obtain a hard copy of your worksheet.

- (2) Create a worksheet using the @PMT function that will calculate the loan payment amount based on any principal, interest, and number of payments. Make your worksheet template look like the following:

Loan Payment Worksheet

Principal Amount: _____
 Interest Rate: _____
 Number of Years: _____
 Payment Amount: _____

Use the following data: Principal 5000
 Interest Rate 12%
 Number of Years 5

The formula for calculating the payment amount is:

@PMT(Principal Amount, Interest Rate/12, Number of Years*12)

Then use any data of your choice for the principal, interest, and number of payments.

Save the worksheet as PAYMENT using the /File Save command.

Use the /Print Printer procedure to obtain a hard copy of your worksheet.

- (3) Create a worksheet using the @DATE function to calculate how many days due that unpaid invoices are using the following data:

ABC Computer Supplies Co.
Outstanding Invoices Report 15-Jul-86

Invoice Number	Customer Number	Invoice Amount	Date Due	Days Due
12466-A	40510	256.89	24-May-86	_____
13987-C	20876	78.75	25-Feb-86	_____
26945-B	19872	113.49	01-Apr-86	_____
27201-C	83904	13.24	03-Jun-86	_____
35443-C	39210	98.43	10-May-86	_____
43223-B	83842	289.93	14-Jun-86	_____
57983-A	92844	36.35	15-Apr-86	_____
58876-B	12938	119.95	19-Jun-86	_____
63211-A	93874	20.55	03-Jul-86	_____
66295-B	76465	308.95	12-Jul-86	_____

Total Amount Due: _____

Average Days Due: _____

Use the @DATE function to express the Due Date and report date as a serial number. Then format the date column to an appropriate date display.

Calculate the days due by subtracting the due date from the report date for each invoice at each underscore. Total the amount overdue and find the average of the days overdue.

Save the worksheet as INVOICE using the /File Save command.

Use the /Print Printer procedure to obtain a hard copy of your worksheet.

- (4) Modify the previous worksheet and use the @IF function to create a worksheet that calculates and prints an Accounts Receivable Aging Report.

Make your worksheet look like the following by changing the report heading and by using the /Worksheet Delete Column command to delete unused columns and the /Worksheet Delete Row command to delete unused rows.

ABC Computer Supplies Co.
A/R Aging Report 15-Jul-86

Invoice Number	Invoice Amount	Date Due	Current	Over 30 Days	Over 60 Days	Over 90 Days
12466-A	256.89	24-May-86	_____	_____	_____	_____
13987-C	78.75	25-Feb-86	_____	_____	_____	_____
26945-B	113.49	01-Apr-86	_____	_____	_____	_____
27201-C	13.24	03-Jun-86	_____	_____	_____	_____
35443-C	98.43	10-May-86	_____	_____	_____	_____
43223-B	289.93	14-Jun-86	_____	_____	_____	_____
57983-A	36.35	15-Apr-86	_____	_____	_____	_____
58876-B	119.95	19-Jun-86	_____	_____	_____	_____
63211-A	20.55	03-Jul-86	_____	_____	_____	_____
66295-B	308.95	12-Jul-86	_____	_____	_____	_____
Totals	_____		_____	_____	_____	_____

You should write formulas at the underscores which determine which column--Current, Over 30 Days, Over 60 Days, or Over 90 Days--in which the Invoice Amount should be displayed. Use a formula that subtracts the invoice date from report date in combination with a logical expression.

For example: Current:

IF(Report Date-Invoice Date<=30 THEN Invoice Amount ELSE 0)

Over 30 Days:

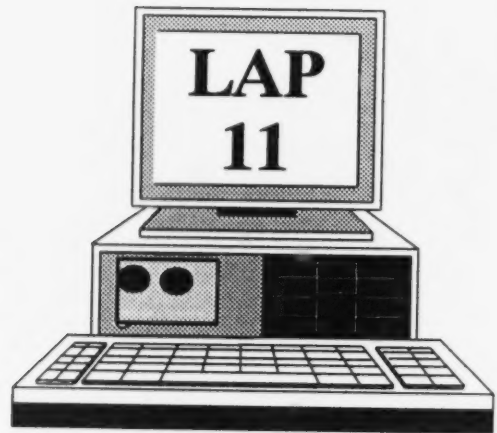
IF(Report Date-Invoice Date>30 AND ReportDate-Invoice Date<=60 THEN Invoice Amount ELSE 0)

Use the/WorksheetGlobalZero Yes command to suppress zeroes.

Total all the columns indicated by the underscore.

Save the worksheet as ARAGING using the /File Save command.

Use the /Print Printer procedure to obtain a hard copy of your worksheet.



LESSON 11

FORMATTING A WORKSHEET 1-2-3

OBJECTIVES:

- * Describe formatting commands
- * Describe global worksheet settings
- * Using worksheet global formatting commands
- * Using worksheet global column-width commands
- * Using worksheet global label-prefix commands
- * Using worksheet insert and delete commands
- * Using the worksheet erase command
- * Describe range formatting commands
- * Using range formatting commands
- * Using range label commands
- * Using range erase commands

REQUIRED MATERIALS:

- * Paper and pen or pencil
- * A DOS diskette
- * Lotus 1-2-3 System Disk
- * A practice disk
- * IBM-PC with 1 or 2 diskette drives or hard disk and printer

READ: FORMATTING COMMANDS

Most of the formatting commands of 1-2-3 are found in the /Worksheet and /Range command menus. The formatting commands are similar under both of these command menus, however, they differ in scope. The /Worksheet formatting commands are in relation to the whole worksheet (called Global) and the /Range formatting commands are in relation to a specified portion of the the worksheet (a Range).

READ: WORKSHEET COMMANDS

The /Worksheet formatting commands are a set of /Worksheet commands that are useful for determining the overall appearance of the worksheet--column widths and display formats.

Some /Worksheet commands tell 1-2-3 about your computer's hardware components and configuration. Other /Worksheet commands determine the way in which 1-2-3 calculates the formulas you enter into the worksheet or make large-scale changes to the worksheet's contents such as erasing the entire worksheet or inserting empty rows and columns.

/Worksheet commands change the way 1-2-3 uses the display screen, allowing you to view two widely-separated parts of the worksheet at the same time.

READ: /WORKSHEET GLOBAL SETTINGS

Using /Worksheet Global commands, you can control five overall aspects of worksheet appearance:

- o Global Numeric Display Format
- o Global Label-Prefix character (label alignment)
- o Global Column Widths
- o Recalculation Procedure
- o Cell protection

When you start creating a new worksheet, it is not necessary to issue /Worksheet Global commands unless you want something other than the initial worksheet settings. When 1-2-3 begins execution, and whenever you issue a /Worksheet Erase command, the initial global settings listed in the following table are established:

<u>Global Setting</u>	<u>Initial Value</u>	<u>Other Possible Values</u>
Numeric Display Format	General	Fixed, Currency, Comma, Percent, Scientific, Date, +/-, Text
Label Alignment	Left-Aligned	Right-Aligned, Centered
Column Width	9 characters	1..240 characters

READ: /WORKSHEET GLOBAL STANDARDS AND OVERRIDES

The /Worksheet Global commands establish overall or global standards used by the worksheet. Unless you issue an override for a particular cell or column or row, 1-2-3 displays it according to the /Worksheet Global settings. The following rules apply to overriding /Worksheet Global settings:

- A. The global numeric display format can be overridden for particular cells with the /Range Format commands.
- B. The global alignment can be overridden for particular cells by typing label-prefix characters and issuing /Range Label-Prefix commands.
- C. The global column-width setting can be overridden for particular columns with /Worksheet Column-Width commands.

DO: STARTING 1-2-3

Start 1-2-3 using the appropriate Lotus 1-2-3 Start-Up Procedure.

DO: LOAD THE WORKSHEET

We are going to use a previously completed worksheet to demonstrate the use of /Worksheet Global Commands. Load the worksheet, **SALES**, using the /File Retrieve command.

DO: /WORKSHEET GLOBAL FORMAT COMMAND

Worksheet Range Copy Move File Print Graph Data System Quit

|
Global Insert Delete Column Erase Titles Window Status PageBreak

|
Format Label-Prefix Column-Width Recalculation Protection Default Zero

|
Fixed Scientific Currency , General +/- Percent Date Text Hidden

|
Time

The /Worksheet Global Format command tells 1-2-3 the way in which numbers are to be displayed. The command has no effect on labels:

1. Press the / to invoke the 1-2-3 command menu.
2. Move the pointer to **Worksheet** and press <Return>.
3. Move the pointer to **Global** and press <Return>.
4. Move the pointer to **Format** and press <Return>.

Several options are displayed on the screen at this point. Here is a summary of these global formats:

Fixed	Fixed number of decimal places (0-15).
Scientific	Exponent scientific notation.
Currency	Floating dollar signs before each entry; commas between thousands; negative values in parentheses; fixed number of decimal places (0-15).
, (comma)	The same as Currency format except no floating dollar signs.
General	Zeros to the right of the decimal are suppressed. This is the initial global display format.

+/-	Horizontal bar graph. Each symbol equals one integer where + is a positive value, - is a negative value, and . (period) is a zero or fraction.
Percent	The value times 100 and a specified number of decimal places (0-15) followed by a percent sign.
Date	Displays the corresponding date value of the serial number in one of five formats: 1: DD-MMM-YY 2: DD-MMM 3: MMM-YY 4: MM/DD/YY 5: MM/DD
Time	Displays the corresponding time value of the serial number in one of four formats: 1: HH:MM:SS AM/PM 2: HH:MM AM/PM 3: HH:MM:SS 24 hour 4: HH:MM 24 hour
Text	Formulas are shown as entered and numbers are in General format.
Hidden	The contents do not appear on the screen although they still exist.

5. Move the pointer to **Fixed** and press <Return>. Type 2 at the prompt for number of decimal places and press <Return>.

Notice that all numeric values in the whole spreadsheet are displayed with 2 decimal places. Setting the numeric format of a cell has no effect on the way 1-2-3 displays a label.

6. Now change the global numeric format to comma by selecting the commands: **/Worksheet Global Format , 2** (for number of decimal places) <Return>.

We could also state this command by using a convention that uses just the first letters of each command, since commands can be selected by either pointing or typing the first letter of the command.

By saying:

`/WGFF,2 <Return>`

would mean to press the slash key, select Worksheet, select Global, select Format, select , (comma), enter the number of decimal places as 2, and press <Return>. We will use this command convention in many of the steps in this and following units.

Notice that some of the cells became filled with asterisks (*). This is because the selected format displays a value too wide to fit in that cell.

One way of handling that would be to change the global column widths.

DO: `/WORKSHEET GLOBAL COLUMN-WIDTH COMMAND`

Worksheet Range Copy Move File Print Graph Data System Quit

|
Global Insert Delete Column Erase Titles Window Status PageBreak

|
Format Label-Prefix Column-Width Recalculation Protection Default Zero

The `/Worksheet Global Column-Width` sets the standard column width. The initial width of 9 spaces can be varied from 1 through 72:

1. Press the `/` to invoke the 1-2-3 command menu.
2. Move the pointer to **Worksheet** and press <Return>.
3. Move the pointer to **Global** and press <Return>.
4. Move the pointer to **Column-Width** and press <Return>.
5. At the prompt to enter the column width type 10 and press <Return>.

All column widths on the worksheet are enlarged to 10 spaces. No cells should display asterisks if the column widths have been properly enlarged.

READ: /WORKSHEET GLOBAL LABEL-PREFIX COMMAND

Worksheet Range Copy Move File Print Graph Data System Quit

|

Global Insert Delete Column Erase Titles Window Status PageBreak

|

Format Label-Prefix Column-Width Recalculation Protection Default Zero

|

Left Right Center

The /Worksheet Global Label-Prefix command controls the general alignment of labels in cells. When you want most of the labels you're about to enter on a worksheet to be left-adjusted, right-adjusted, or centered in their cells, you should use this command.

To use this command select /Worksheet Global Label-Prefix and then choose Left, Right, or Center alignment. Left (') is the initial global label alignment.

Whenever you type a label without a prefix, 1-2-3 gives it the initial Global Label-Prefix character. Changing the Global Label-Prefix only affects labels you type after the command. Existing labels are not changed.

DO: /WORKSHEET INSERT AND DELETE COMMANDS

Worksheet Range Copy Move File Print Graph Data System Quit

|

Global Insert Delete Column Erase Titles Window Status PageBreak

| |

Column Row Column Row

These /Worksheet commands provide for rows or columns to be inserted anywhere in the worksheet. First let's insert some extra rows between the title and column headings of this worksheet:

1. Move the pointer to cell B2. This is where you are going to insert rows. Since this command will involve indicating a range, it is always best to set the pointer at the beginning of the range before invoking the command menu.
2. Press the / to invoke the 1-2-3 command menu.
3. Move the pointer to **Worksheet** and press <Return>.
4. Move the pointer to **Insert** and press <Return>.
5. Move the pointer to **Rows** and press <Return>.
6. At the prompt to enter a Range, move the pointer to cell B4 and press <Return>.

Note: This will insert three extra rows in this area of the worksheet.

Notice it is not necessary to expand the pointer to cover the row to the edge of the worksheet--it is only necessary to expand the pointer to cover at least one cell on the row you want to insert.

7. Now delete these rows. Press the / to invoke the 1-2-3 command menu. Move the pointer to **Worksheet** and press <Return>. Move the pointer to **Delete** and press <Return>. Move the pointer to **Row** and press <Return>. At the prompt to enter a Range, move the pointer to cell B4 and press <Return>.

Note: Now the worksheet should look like it did originally.

If you accidentally insert or delete too many rows during this operation, just continue because we are not going to save this version of the worksheet.

8. The commands work exactly the same for inserting and deleting columns. Practice inserting and deleting columns if you like.

DO: /WORKSHEET ERASE COMMAND

Worksheet Range Copy Move File Print Graph Data System Quit

Global Insert Delete Column Erase Titles Window Status PageBreak

The Worksheet Erase command erases the entire worksheet area and returns all settings except /Worksheet Global Default settings to their initial values. This command is useful when you want to begin again.

Be careful in using this command that you have saved your worksheet before erasing it because it cannot be recovered once it is erased except by retrieving it from a file.

1. Press the / to invoke the 1-2-3 command menu.
2. Move the pointer to **Worksheet** and press <Return>.
3. Move the pointer to **Erase** and press <Return>.
4. Move the pointer to **Yes** and press <Return>.

This final prompt is to be sure that you know what you are doing before the command proceeds. Usually you want to be sure that you have saved your worksheet.

It is not necessary to save the worksheet because you have saved it on previous occasions and because you do not want any of the changes from the preceding operations to be overwritten on your worksheet file.

READ: RANGE FORMATTING COMMANDS

When using 1-2-3, you often need to perform operations on a range of cells. Since 1-2-3 is range oriented, it has a group of /Range commands that processes cell ranges. In addition to worksheet formatting commands, some of the functions of this group of commands includes:

- o Assigning a range name to a cell range
- o Processing a range as a fill-in-the-blanks form
- o Readjusting the labels in a column range to a new "paragraph width"
- o Erasing cell contents
- o Preventing or allowing cell contents to be changed

As demonstrated in previous modules, 1-2-3 allows you to indicate the range to be processed in a variety of ways:

- A. Expanding the cell pointer to cover the range.
- B. Typing the cell addresses of two opposite corners.
- C. Typing a range name, or selecting one from a menu of range names that 1-2-3 displays.

Many of the /Range formatting commands are similar to the /Worksheet commands in function, but different in scope-- meaning that they affect only a portion of the worksheet rather than the whole worksheet.

DO: LOAD THE WORKSHEET

We are going to use a previously completed worksheet to demonstrate the use of /Range Format Commands. Load the worksheet, SALES, using the /File Retrieve command.

DO: /RANGE FORMAT COMMAND

Worksheet Range Copy Move File Print Graph Data System Quit

|

Format Label Erase Name Justify Protect Unprotect Input Value Transpose

|

Fixed Scientific Currency , General +/- Percent Date Text Hidden

|

Time

The Range Format commands work exactly like the Worksheet Global Format commands except for the scope. With the Range Format commands you can specify numeric formats for a certain range, like a single cell, a column or columns, a row or rows:

1. Move the pointer to cell B5 and press the / to invoke the 1-2-3 command menu.
2. Move the pointer to **Range** and press <Return>.
3. Move the pointer to **Format** and press <Return>.
(Refer to the section on /Worksheet Global Format commands for a definition of the various formats).
4. Move the pointer to **Fixed** and press <Return>. Type 2 at the prompt for number of decimal places and press <Return>.
5. Move the pointer to **F12** to format the range B5..F12 and press <Return>.

Notice that all dollar values in the whole spreadsheet are displayed with 2 decimal places.

We could have also stated the instruction to enter this command as:

/RFF2<Return> B5..F12 <Return>

DO: /RANGE LABEL COMMAND

Worksheet Range Copy Move File Print Graph Data System Quit

Format Label Erase Name Justify Protect Unprotect Input Value Transpose

Left Right Center

The Range Label commands work exactly like the Worksheet Global Label-Prefix commands except for the scope. With the Range Label commands you can specify label formats for a certain range, like a single cell, column or columns, a row or rows.

1. Move the pointer to cell A5 and press the / to invoke the 1-2-3 command menu.
2. Move the pointer to **Range** and press <Return>.
3. Move the pointer to **Label** and press <Return>.
4. Move the pointer to **Center** and press <Return>.
5. Move the pointer to A9 to format the range A5..A9 and press <Return>.

Keep in mind that normally you would format the column heading over the column data rather than formatting the column data underneath the column heading.

DO: /WORKSHEET COLUMN COMMAND

Worksheet Range Copy Move File Print Graph Data System Quit

|
Global Insert Delete Column Erase Titles Window Status PageBreak

|
Set-Width Reset-Width Hide Display

Although the /Worksheet Column command is not a Range command, since it affects only a portion of the worksheet, we will mention it with the Range formatting commands. This command is used primarily to set the width of a single column:

1. Move the pointer to any cell in column A and press the / to invoke the 1-2-3 command menu.
2. Move the pointer to **Worksheet** and press <Return>.
3. Move the pointer to **Column** and press <Return>.
4. Move the pointer to **Set-Width** and press <Return>.
5. At the prompt to enter a column width, type 6 and press <Return>.
6. Now set the column width to 12 by typing /WCS12 .

DO: /RANGE ERASE COMMAND

Worksheet Range Copy Move File Print Graph Data System Quit

|
Format Label Erase Name Justify Protect Unprotect Input Value Transpose

The Range Erase command works exactly like the Worksheet Erase command except for the scope. With the Range Erase command you can erase a single cell or a specified range of cells.

1. Move the pointer to cell A1 and press the / to invoke the 1-2-3 command menu.
2. Move the pointer to **Range** and press <Return>.
3. Move the pointer to **Erase** and press <Return>.

FORMATTING A WORKSHEET 11-12

4. Move the pointer to G12 to erase the range A1..G12 and press <Return>.

The specified range is now erased. In this case we specified the whole worksheet as the range to erase. However, you may erase a range consisting of a smaller portion of the worksheet--as little as one cell. In fact, a good operation to remember to erase the contents of a single cell is:

- o Move the pointer to the cell to be erased.
- o Press /RE <Return> to erase the cell.

CASE STUDY: FLANAGAN PAPER COMPANY FINANCIAL STATEMENTS

Flanagan Paper Company is using Lotus 123 to prepare its financial statements for fiscal year ending October 31, 1985. Prepare an Income Statement, Balance Sheet, Budget Income Statement, and ProForma Balance Sheet. Format these financial statements using the following specifications:

- A. Properly adjust numeric formatting. Dollar amounts should be printed with two decimal places, commas and negatives in parentheses. Numbers that are percentages should be printed with 0 decimal places and the percent (%) sign.
- B. Properly adjust label formatting. Headings over columns of numbers should be right-adjusted while headings over columns of labels should be left-adjusted.
- C. Properly adjust column widths to allow plenty of room for all cell entries. However, prevent too much space between columns.

(1) INCOME STATEMENT

Flanagan Paper Company needs an Income Statement prepared as of October 31, 1985. Using 1-2-3, prepare an income statement for Flanagan Paper Company using the data from the template below.

Include the following on the worksheet:

- o All account categories should be totaled where x's are printed.
- o Gross Profit is Total Revenue minus Cost of Goods Sold.
- o Net Income from Operations is Gross Profit minus Total Expenses.
- o All amount columns should be formatted with two decimal places, commas, and negatives printed in parentheses.
- o Save the worksheet as INCOME and obtain a print on the printer.

FLANAGAN PAPER COMPANY
INCOME STATEMENT
FOR PERIOD ENDING 10/31/85

REVENUE

Sales	23048.30
Sales Discount	-276.48
Sales Returns and Allowance	-28.00

TOTAL REVENUE	xxxxxxxx

COST OF GOODS SOLD

Beginning Inventory	35000.00
Purchases	25522.00
Purchases Discount	-403.07
Purchases Returns and Allowance	-86.40
Less Ending Inventory	-50000.00

COST OF GOODS SOLD	xxxxxxxx

GROSS PROFIT

xxxxxxxx

EXPENSES

Advertising Expense	562.90
Insurance Expense	250.00
Depreciation Expense	1000.00
Office Supplies Expense	186.00
Legal and Professional Fees	279.00

TOTAL EXPENSES

xxxxxxxx

NET INCOME FROM OPERATIONS

xxxxxxxx

=====

(2) BALANCE SHEET

Flanagan Paper Company needs a Balance Sheet prepared as of October 31, 1985. Using 1-2-3, prepare a balance sheet for Flanagan Paper Company using the data from the template below.

Include the following on the worksheet:

- o All account categories should be totaled where x's are printed.
- o Assets are equal to Liabilities and Capital.
- o All amount columns should be formatted with two decimal places, commas, and negatives printed in parentheses.
- o Save the worksheet as BALANCE and obtain a print on the printer.

FLANAGAN PAPER COMPANY
BALANCE SHEET
AS OF 10/31/85

ASSETS

Cash	16050.20
Accounts Receivable	9560.31
Merchandise Inventory	50000.00
Store Supplies	280.00
Prepaid Insurance	1486.20
Store Equipment	12272.00
Accum. Deprec.--Store Equipment	-4900.00
Office Equipment	3200.00
Accum. Deprec.--Office Equipment	-1330.00
Building	60000.00
Accum. Deprec.--Building	-7150.00
Land	10000.00

TOTAL ASSETS

XXXXXXXXXX.XX

=====

LIABILITIES

Accounts Payable	8314.30
Sales Tax Payable	823.17
Mortgage Note Payable	14300.00

TOTAL LIABILITIES

XXXXXXXXXX.XX

CAPITAL

Sally Flanagan, Capital	126031.24
-------------------------	-----------

TOTAL CAPITAL

XXXXXXXXXX.XX

LIABILITIES AND CAPITAL

XXXXXXXXXX.XX

=====

(3) BUDGET INCOME STATEMENT

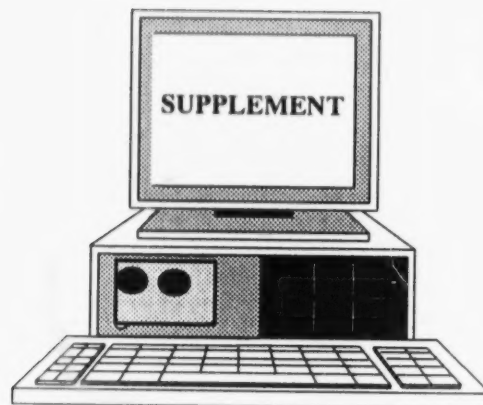
Flanagan Paper Company needs a Budget Income Statement prepared as of October 31, 1985. Using 1-2-3, prepare a budget income statement for Flanagan Paper Company using the data from the template below.

Include the following on the worksheet:

- o Total all account categories where x's are printed.
- o Gross Profit is Total Revenue minus Cost of Goods Sold.
- o Net Income from Operations is Gross Profit minus Total Expenses.
- o All amount columns should be formatted with two decimal places, commas, and negatives printed in parentheses, except Dollar Variance and Percent Variance.
- o The Dollar Variance column should be expressed as a signed number (-) when negative. (Actual-Budget)
- o The Percent Variance column should be expressed as a percentage with the % sign. (IF Budget=0 THEN 0 ELSE Dollar Variance/Budget.)
- o Save the worksheet as BUDGET and obtain a print on the printer.

FLANAGAN PAPER COMPANY
BUDGET INCOME STATEMENT
FOR PERIOD ENDING 10/31/85

	Actual	Budget	Dollar Variance	Percent Variance
REVENUE				
Sales	23048.30	20000.00	xxxx.xx	xx%
Sales Discount	-276.48		xxxx.xx	xx%
Sales Returns and Allowance	-28.00		xxxx.xx	xx%
	-----	-----	-----	-----
TOTAL REVENUE	xxxxx.xx	xxxxxxx.xx	xxxxxx.xx	xxx%
COST OF GOODS SOLD				
Beginning Inventory	35000.00	35000.00	xxxx.xx	xx%
Purchases	25522.00	20000.00	xxxx.xx	xx%
Purchases Discount	-403.07		xxxx.xx	xx%
Purchases Returns and Allowance	-86.40		xxxx.xx	xx%
Less Ending Inventory	-50000.00	-50000.00	xxxx.xx	xx%
	-----	-----	-----	-----
COST OF GOODS SOLD	xxxxxx.xx	xxxxxx.xx	xxxxxx.xx	xxx%
GROSS PROFIT	xxxxxx.xx	xxxxxx.xx	xxxxxx.xx	xxx%
	-----	-----	-----	-----
EXPENSES				
Advertising Expense	562.90	500.00	xxxx.xx	xx%
Insurance Expense	250.00	250.00	xxxx.xx	xx%
Depreciation Expense	1000.00	1200.00	xxxx.xx	xx%
Store Supplies Expense	186.00	200.00	xxxx.xx	xx%
Legal & Prof. Fees Ex.	279.00	200.00	xxxx.xx	xx%
	-----	-----	-----	-----
TOTAL EXPENSES	xxxxxx.xx	xxxxxx.xx	xxxxxx.xx	xxx%
	-----	-----	-----	-----
NET INCOME FROM OPERATIONS	xxxxxx.xx	xxxxxx.xx	xxxxxx.xx	xxx%
	=====	=====	=====	=====



**LOTUS 1-2-3 SUPPLEMENTAL WORKSHEET EXERCISES
BEGINNING COURSE**

REQUIRED MATERIALS:

- * Paper and pen or pencil
- * A DOS diskette
- * Lotus 1-2-3 System Disk
- * A practice disk
- * IBM-PC with 1 or 2 diskette drives or hard disk and printer

GRADING STANDARDS:

- * Formula errors: -5 pts. per column or row
- * Formatting errors: -3 pts. per column or row
- * Miscellaneous errors: -1 pt. per error

LEARNING PROCEDURES

- (1) Create each worksheet as directed in the application. Be certain to copy formulas as needed. Format the worksheet to look like the example or follow the formatting instructions given with the application.
- (2) Obtain a printed copy of your completed worksheet.
- (3) Obtain a printed copy of the formulas for your completed worksheet.
- (4) Hand in both printed reports to your instructor for grading.

APPLICATION #1 (50 pts.)

Create a worksheet that will compute the interest on a loan for one year. You should organize your worksheet as follows:

ANNUAL INTEREST WORKSHEET

BORROWER	PRINCIPAL	INTEREST RATE	INTEREST
M. Smith	400.00	8.0%	
D. Jones	1000.00	8.5%	
H. McDey	1500.00	10.0%	
R. Serit	800.00	9.0%	
J. Franks	750.00	9.5%	
O. Mann	250.00	8.0%	
R. Hancock	600.00	10.5%	
K. Ewing	1000.00	8.5%	
E. Wyatt	1200.00	11.5%	
D. Burton	300.00	11.0%	

TOTALS

The formula for INTEREST = PRINCIPAL X INTEREST RATE.
Sum the PRINCIPAL and INTEREST columns.

APPLICATION #2 (50 pts.)

Create a worksheet that will calculate Gross and Net Pay for a business payroll. You should organize your worksheet as follows:

WEEKLY PAYROLL WORKSHEET

EMPLOYEE	WAGES	HOURS	DEDUCTIONS	GROSS PAY	NET PAY
J. Henry	3.50	40	50.00		
J. Trotsky	7.00	35	75.25		
M. Martin	5.00	28	25.50		
K. Ownby	6.50	40	38.95		
S. Miller	9.00	40	120.00		
B. Barstow	10.50	37	98.50		
R. Sealey	7.25	35	72.50		
L. Lane	12.50	20	48.25		
M. Nichols	15.00	40	150.00		
V. Thompson	8.75	39	102.50		

TOTALS

The formula for GROSS PAY = WAGES X HOURS.
The formula for NET PAY = WAGES X HOURS - DEDUCTIONS.
Sum the DEDUCTIONS, GROSS PAY, and NET PAY columns.

APPLICATION #3 (50 pts.)

Create a worksheet that will maintain personal financial records for a person's checking account. You should organize your worksheet as follows:

PERSONAL FINANCES WORKSHEET

WEEK ENDING	HOUSING	FOOD SUNDRY	AUTO	PERSONAL MISC.	TOTALS	% TOTAL
07-Jul-87	350.00	60.00	25.00	12.00		
14-Jul-87		72.50	14.50	15.00		
21-Jul-87		40.00	10.00	18.75		
28-Jul-87		26.35	17.72	22.18		
04-Aug-87		15.55	22.50	14.75		
TOTALS						
% TOTAL						

Sum the WEEK ENDING rows.

Sum the HOUSING, FOOD/SUNDRY, AUTO, and PERSONAL/MISC. columns.

The formula for % TOTAL (rows and columns) = TOTALS (column or row) / total of TOTALS (column/row).

APPLICATION #4 (50 pts.)

Using the Personal Finances Worksheet, create a pie chart using DISTRIBUTION OF PERSONAL FINANCES as the main heading.

Use the % TOTAL for the columns as the data to be graphed. Use the column headings, HOUSING, SUNDRY, AUTO, PERSONAL/MISC. as the labels for each section of the chart.

Explode the section for PERSONAL/MISC.

Print the graph.

APPLICATION #5 (50 pts.)

Using the Personal Finances Worksheet, create a bar graph using DISTRIBUTION OF PERSONAL FINANCES as the main heading.

Use the TOTALS for the columns as the data to be graphed. Use the column headings, HOUSING, SUNDRY, AUTO, MISC., as the X-axis labels.

Use DOLLARS as the Y-axis labels.

Print the graph.

APPLICATION #6 (50 pts.)

You are the manager of a baseball team. You need to look at the past performance of your players. The following statistics about the players have been provided for you:

PLAYER	TIMES AT BAT	HITS
J. JEFFREY	549	179
S. SHELL	469	130
W. GILES	406	91
L. BOWER	330	80
C. CARLEY	226	66
E. NOODLE	272	64
Z. TEHAS	127	38
N. GRATES	388	106
P. ROSEN	460	151
H. GONZALEZ	397	94
S. SOPER	127	28

As the manager you need to determine the batting average for each player. In addition, you would like to know the highest average, lowers average, and team average.

Create the additional columns, labels, and formulas necessary to complete the worksheet. Format batting averages to three decimal places only.

HINT: Batting Average = Hits / Times at Bat.
Use the @MAX and @MIN functions to find the highest and lowest averages.

UNIT TEST--Lesson 1

Name: _____

Date: _____

MULTIPLE CHOICE

Answer the following by writing the letter of the best choice for each question in the space provided at the left of the question (5 pts. each):

- _____ 1. The name of the first electronic spreadsheet program was:
 - a. SuperCalc3
 - b. Multiplan
 - c. Lotus 1-2-3
 - d. VisiCalc
 - e. VisiPlan

- _____ 2. The first electronic spreadsheet program was partly responsible for the success of what microcomputer?
 - a. VIC 20
 - b. TRS 80
 - c. Apple II
 - d. IBM PC Jr.
 - e. none of the above

- _____ 3. An electronic spreadsheet organizes the computer screen into:
 - a. lines and spaces
 - b. rows and columns
 - c. dots and dashes
 - d. millimeters and centimeters
 - e. top and bottom

- _____ 4. The intersection of a row and a column on the worksheet is called:
 - a. a mail box
 - b. a slot
 - c. a stop light
 - d. the work area
 - e. a cell

- _____ 5. The very first electronic spreadsheet had a capacity of 256 rows and 64 columns. Lotus 1-2-3 Release 1A is _____ rows by _____ columns.
 - a. 128, 1024
 - b. 1024, 128
 - c. 256, 2048
 - d. 2048, 256
 - e. none of the above

UNIT TEST--Lesson 1 Continued

- _____ 6. The cell identified by the 28th column and the 28th row is:
- a. A28
 - b. AA28
 - c. 28AA
 - d. AB28
 - e. AC28
- _____ 7. Cell BA53 is located at:
- a. the 28th column and 53rd row
 - b. the 53rd row and 28th column
 - c. the 52nd column and 53rd row
 - d. the 53rd column and 53rd row
 - e. none of the above
- _____ 8. The _____ is a highlighted rectangle indicating the point where data is to be entered or identifying a function to be performed.
- a. highlighter
 - b. pointer
 - c. cell
 - d. column
 - e. index
- _____ 9. The cell where data is to be entered is called:
- a. the active cell
 - b. pointer cell
 - c. x and y coordinate
 - d. input slot
 - e. all of the above
- _____ 10. All spreadsheets can split the screen into horizontal and vertical _____.
- a. doors
 - b. lines
 - c. shelves
 - d. windows
 - e. columns

UNIT TEST--Lesson 1 Continued

COMPLETION

Complete the following questions:

11. List the Lotus Start-Up Procedure with the computer powered on and the DOS A> prompt on the screen (10 pts.):

A. _____

B. _____

12. List the Lotus Start-Up Procedure for bypassing the Lotus Access System and going directly to 1-2-3 (10 pts.):

A. _____

B. _____

13. List the Lotus Start-Up Procedure for starting the Lotus Access System requiring a DOS boot diskette (30 pts.)

A. _____

B. _____

C. _____

D. _____

E. _____

UNIT TEST--Lesson 2

Name: _____

Date: _____

MULTIPLE CHOICE

Answer the following by writing the letter of the best choice for each question in the space provided at the left of the question (10 pts. each):

- _____ 1. The process of moving the cell pointer to a particular cell to type an entry or issue a command is called:
 - a. pointing
 - b. scrolling
 - c. homing
 - d. jumping
 - e. paging

- _____ 2. The fastest method to move long distances in the worksheet is to:
 - a. use the pointer movement keys
 - b. use the paging movement keys
 - c. jump [GoTo] another cell
 - d. scroll the worksheet
 - e. none of the above

- _____ 3. Before using the pointer movement keys on the numeric keypad, which key must be de-activated?
 - a. [Scroll Lock]
 - b. [Num Lock]
 - c. [Home]
 - d. [End]
 - e. [PgDn]

- _____ 4. Which function key invokes the [GoTo] function?
 - a. F2
 - b. F3
 - c. F4
 - d. F6
 - e. none of the above

- _____ 5. Moving the worksheet without changing the position of the pointer is called:
 - a. jumping
 - b. pointing
 - c. scrolling
 - d. homing
 - e. paging

UNIT TEST--Lesson 2 Continued

MATCHING

Match the pointer movement description with the correct pointer movement key by writing the letter(s) for the correct key(s) in the blank at the left of the description (5 pts. each):

- | | |
|--|--|
| _____ 6. Causes all pointer movements to scroll the window | a. <Right Arrow>
b. <Left Arrow>
c. <Up Arrow> |
| _____ 7. Moves the pointer one page to the left | d. <Down Arrow>
e. [GoTo] |
| _____ 8. Moves the pointer one cell upwards | f. [Home]
g. [PgUp] |
| _____ 9. Moves the pointer one page downward | h. [PgDn]
i. [Scroll Lock] |
| _____ 10. Moves the pointer one cell to the right | j. [->] (Tab Right)
k. [<-] (Tab Left) |
| _____ 11. Moves the pointer one page upward | l. [Ctrl]<Right Arrow>
m. [Ctrl]<Left Arrow>
n. [Num Lock] |
| _____ 12. Moves the pointer one cell downward | |
| _____ 13. Moves the pointer one page to the right | |
| _____ 14. Moves the pointer to a selected cell | |
| _____ 15. Moves the pointer to the top left corner | |

UNIT TEST--Lesson 3

Name: _____

Date: _____

MULTIPLE CHOICE

Answer the following by writing the letter of the best choice for each question in the space provided at the left of the question (10 pts each):

- _____ 1. Which of the following is not information contained on the first line of the control panel?
 - a. the location of the cell pointer
 - b. menu items
 - c. the display format of the active cell
 - d. the contents of the current cell

- _____ 2. A cell entry can be as long as _____ characters.
 - a. 80
 - b. 100
 - c. 200
 - d. 240
 - e. 254

- _____ 3. An instruction for 1-2-3 to calculate a number is called:
 - a. pointer
 - b. label
 - c. number
 - d. formula
 - e. operation

- _____ 4. Which of the following is not a way in which you can change an entry?
 - a. cancellation by pressing [Esc]
 - b. replacement with another entry
 - c. erase the existing entry
 - d. editing the existing entry
 - e. backslashing over the existing entry

- _____ 5. To enter Edit Mode, press which key:
 - a. [E]
 - b. [Ctrl] [E]
 - c. F1
 - d. F2
 - e. none of the above

UNIT TEST--Lesson 3 Continued

TRUE OR FALSE

Mark each of the following as T (TRUE) or F (False) in the space provided at the left of each statement (5 pts. each):

- _____ 6. Whenever you finish typing a cell entry, you must press <Return> to store the entry in the cell.
- _____ 7. Whenever you complete a cell entry, 1-2-3 checks the entry for errors, recalculates every formula, updates the display screen, and returns to Ready Mode.
- _____ 8. You must always use a -prefix character for 1-2-3 to know what type of entry you are making in the cell.
- _____ 9. 1-2-3 always inserts new characters in Edit Mode.

IDENTIFICATION

Identify the mode indicator for each of the following by writing VALUE or LABEL in the space to the left of each character when that character is the first character of a cell entry (3 pts. each):

- | | |
|-------------|--------------|
| _____ 10. @ | _____ 15. \$ |
| _____ 11. " | _____ 16. 9 |
| _____ 12. + | _____ 17. - |
| _____ 13. A | _____ 18. . |
| _____ 14. (| _____ 19. ^ |

UNIT TEST--Lesson 4

Name: _____

Date: _____

MULTIPLE CHOICE

Answer the following by writing the letter of the best choice for each question in the space provided at the left of the question (10 pts. each):

- _____ 1. To initiate a 1-2-3 command, press which key:
 - a. /
 - b. \
 - c. (
 - d.)
 - e. +

- _____ 2. Press which key to "undo" a 1-2-3 command:
 - a. [End]
 - b. [Home]
 - c. [Esc]
 - d. [Ctrl]
 - e. [Alt]

- _____ 3. A list of commands displayed in the control panel that informs you of your options is called:
 - a. command sequence
 - b. menu
 - c. prompt
 - d. range
 - e. selection criteria

TRUE OR FALSE

Mark each of the following as T (TRUE) or F (False) in the space provided at the left of each statement (10 pts. each):

- _____ 4. 1-2-3's commands are organized into a multi-level menu system.

- _____ 5. Each 1-2-3 command has a name and consists of only a single keyword.

- _____ 6. After 1-2-3 executes a command it usually returns to Menu Mode.

- _____ 7. You can select a keyword from each command menu by either pointing or typing.

UNIT TEST--Lesson 4 Continued

- _____ 8. Pointing is the fastest method for selecting a keyword.
- _____ 9. A cardinal principle of the computer world states that the more characters you type, the less chance of making mistakes.
- _____ 10. When moving the pointer to select a keyword from the command menu, you may only move the pointer from left to right.

UNIT TEST--Lesson 5

Name: _____

Date: _____

MULTIPLE CHOICE

Answer the following by writing the letter of the best choice for each question in the space provided at the left of the question (10 pts. each):

- _____ 1. A group of one or more cells in a rectangular block is
 - a. cell block
 - b. grouping
 - c. collection
 - d. range
 - e. arrangement

- _____ 2. The key which anchors one corner of the cell pointer to the current cell is:
 - a. [Esc]
 - b. <Return>
 - c. . (Period)
 - d. + (Plus Sign)
 - e. <Backspace>

- _____ 3. The location of the unanchored corner of the expanded cell pointer is called:
 - a. unanchored cell
 - b. anchored cell
 - c. current cell
 - d. free cell
 - e. reference cell

- _____ 4. Which of the following is not a way to indicate a range?
 - a. typing cell address
 - b. pressing the [Esc] key
 - c. expanding the cell pointer
 - d. using a range name

TRUE OR FALSE

Mark each of the following as T (TRUE) or F (FALSE) in the space provided at the left of each statement (5 pts. each):

- _____ 5. If the pointer is not already anchored, pressing the period anchors one corner of the cell pointer to the current cell.

- _____ 6. If the pointer is already anchored, pressing the period moves the anchor to the next corner of the expanded pointer.

UNIT TEST--Lesson 5 Continued

7. If the pointer is not already anchored, pressing [Esc] when 1-2-3 is prompting you to indicate a range anchors one corner of the cell pointer to the current cell.
8. If the pointer is already anchored, pressing [Esc] once has the effect of shrinking the expanded pointer and removing the anchor.
9. If the pointer is not already anchored, pressing the backspace key cancels the range specification and returns the cell pointer to the current cell.
10. If the pointer is already anchored, pressing the backspace key cancels the range specification and returns the cell pointer to the current cell.

MATCHING

Match the range with the appropriate cell specifications by writing the letter of the range rectangle from the worksheet below in the blank at the left of the range specifications (5 pts. each):

	A	B	C	D	E	F	G	H
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								

11. E9..D13

12. B17..G15

13. B3..D8

14. G6..F3

15. G14..G9

16. B13..B10

UNIT TEST--Lesson 6

Name: _____

Date: _____

TRUE OR FALSE

Mark each of the following as T (TRUE) or F (FALSE) in the space provided at the left of each statement (10 pts. each):

- _____ 1. If a formula begins with a cell reference letter, it must be preceded by a "+" (plus) sign or "(" (left parenthesis).
- _____ 2. 1-2-3 right-justifies labels and left-justifies numbers.
- _____ 3. A label that is longer than the width of a cell is called a "long label" and continues over any empty cells to its right.
- _____ 4. It is a good rule to right-justify column headings over columns of numbers and left-justify column headings over columns of labels.
- _____ 5. The label prefix " (quotation mark) causes labels to be left-justified in a cell.
- _____ 6. One of the things that 1-2-3 does best is to perform calculations.
- _____ 7. The / (slash) is the multiplication sign and the * (asterisk) is the division sign in 1-2-3.
- _____ 8. With the pointer located at any cell location, you press the / (slash) to invoke 1-2-3 commands on the second and third lines of the control panel.
- _____ 9. 1-2-3 allows your worksheet to be displayed on the screen or printed on a printer.
- _____ 10. A 1-2-3 worksheet may be saved in a file on a disk for later use or editing.

UNIT TEST--Lesson 7

Name: _____

Date: _____

MULTIPLE CHOICE

Answer the following by writing the letter of the best choice for each question in the space provided at the left of the question (10 pts. each):

- _____ 1. A collection of data that is organized in fields and records is a:
a. spreadsheet
b. database
c. graph
d. program
- _____ 2. A label that is longer than the width of the cell into which it is being typed is called:
a. long label
b. wide label
c. character string
d. column heading
- _____ 3. The label-prefix character which right-justifies labels in a cell is:
a. ^
b. '
c. "
d. !
- _____ 4. It is a good rule to right-justify column headings over columns of _____ and left-justify column headings over columns of _____.
a. numbers, labels
b. numbers, formulas
c. labels, numbers
d. labels, formulas
- _____ 5. Before you can sort records in a database, you must specify the range you want to sort, called the _____.
a. primary key
b. secondary key
c. column headings
d. data range

UNIT TEST--Lesson 7 Continued

- _____ 6. When sorting records in a database, the field (or column) which is used to determine the new order of the records is called:
- a. primary key
 - b. secondary key
 - c. data range
 - d. ordering field
- _____ 7. The field (or column) that is used to break ties that occur when two or more records have the same entry in the primary sort key field is called:
- a. primary key
 - b. secondary key
 - c. data range
 - d. alphabetic key
- _____ 8. An alphabetic listing would be in _____ order.
- a. ascending
 - b. descending
 - c. condescending
 - d. irreversible

IDENTIFICATION

Identify appropriate field names (column headings) for the following database (5 pts. each):

9. a. _____ b. _____ c. _____ d. _____
- | | | | |
|--------------|--------------------|-------|----|
| 585-54-3201, | Steven Smith, | 3.35, | 40 |
| 444-65-4568, | Diane Dandee, | 3.50, | 35 |
| 221-14-1516, | Kyle Kaleznik, | 4.25, | 40 |
| 432-35-6819, | Chris Christopher, | 3.75, | 40 |

UNIT TEST--Lesson 8

Name: _____

Date: _____

MATCHING

Match the function with the appropriate definition by writing the letter for the function in the blank to the left of the definition (10 pts. each):

- | | | |
|----------|--|--|
| _____ 1. | A chart which compares parts to the whole so each value in the range is a wedge of pie. | a. line graph
b. bar graph
c. XY graph
d. stacked bar
e. pie chart |
| _____ 2. | Each value in the X range is paired with the corresponding value in the Y range to plot points on the graph. | |
| _____ 3. | The corresponding value from each data range is stacked above the preceding value in each bar. | |
| _____ 4. | Each value is represented by a point at an appropriate distance above the horizontal axis and connected by a line. | |
| _____ 5. | Each value in a range is represented with a bar of varying height. | |

MULTIPLE CHOICE

Answer the following by writing the letter of the best choice for each question in the space provided at the left of the question (10 pts. each):

- _____ 6. Graphs are organized according to an X and a Y axis. The X axis is the _____ range and the Y axis is the _____ range.
- a. left, right
 b. right, left
 c. horizontal, vertical
 d. vertical, horizontal
- _____ 7. The Y axis can be set with as many as _____ ranges.
- a. two
 b. four
 c. five
 d. six

UNIT TEST--Lesson 8 Continued

- _____ 8. When creating pie charts, a wedge of the chart that is offset from the rest of the pie in order to give significance to that wedge is said to be:
- a. unloaded
 - b. exploded
 - c. shaded
 - d. cut
- _____ 9. To obtain a print-out of your completed graph, it is necessary to use:
- a. the Utilities disk
 - b. the PrintGraph disk
 - c. the /Print Printer Graph command
 - d. the PrtSc key
- _____ 10. To display a graph on the screen, use the _____ command.
- a. View
 - b. Print
 - c. Display
 - d. Graph

UNIT TEST--Lesson 9

Name: _____

Date: _____

TRUE OR FALSE

Mark each of the following as T (TRUE) or F (FALSE) in the space provided at the left of each statement (4 pts. each):

- _____ 1. Formulas, like numbers, may contain space characters.
- _____ 2. When copying formulas, 1-2-3 assumes all cell references in the formula to be relative unless otherwise indicated.
- _____ 3. 1-2-3 records the position of each referenced cell relative to the formula cell instead of remembering the formula as a letter-number combination.
- _____ 4. Addition and subtraction are performed before division and multiplication.
- _____ 5. Parentheses override all arithmetic operations except exponentiation.
- _____ 6. Arithmetic operations of equal precedence are performed from left to right.
- _____ 7. Negative number is performed before addition, subtraction, multiplication, and division.
- _____ 8. Logical operations have a higher precedence than arithmetic operations.

MATCHING

Match the term with the appropriate definition by writing the letter(s) for the term in the blank at the left of the definition (4 pts. each):

- | | |
|--|--------------------|
| _____ 9. Cell whose values are used in the formula | a. absolute |
| _____ 10. Positional relationship | b. relative |
| _____ 11. Characters which represent arithmetic operations | c. formula |
| _____ 12. Order of operations | d. referenced cell |
| _____ 13. Instruction for 1-2-3 to calculate a number | e. operators |
| _____ 14. Operation to "raise to the power" | f. multiplication |
| | g. precedence |
| | h. division |
| | i. exponentiation |

UNIT TEST--Lesson 9 Continued

SHORT ANSWER

Using the following worksheet, complete formulas as specified (4 pts. each):

	A	B	C	D	E	F	G	H
1	3	6	3	8				
2	4	2	4	3				
3	5	1	7	6				
4	6	3	5	1				
5								
6								

15. Write a formula to sum column A: _____

What is the result? _____

16. Write a formula to sum row 1: _____

What is the result? _____

17. Write a formula to divide the sum of column A by 4: _____

What is the result? _____

18. Write a formula to sum the squares (raise to power of 2) of all the numbers in column D: _____

What is the result? _____

19. Write a formula to multiply the sum of A2 and B2 by C2 and then subtract D2: _____

What is the result? _____

20. Write a formula to subtract the sum of column B from the sum of column C: _____

What is the result? _____

UNIT TEST--Lesson 9 Continued

IDENTIFICATION

Using the following worksheet data, identify the logic of the following compound expressions by writing TRUE or FALSE in the blank to the left of each expression (4 pts. each):

	A	B	C
1	2	11	
2	5	12	
3	8	10	
4	7	14	
5			

- _____ 21. $+A1 > B1 \# OR \# B1 > A1$
- _____ 22. $+A1 > B1 \# AND \# B1 > A1$
- _____ 23. $@SUM(A1..A4) > @SUM(B1..B4)$
- _____ 24. $@SUM(A1..A4) > 30 \# OR \# @SUM(B1..B4) > 30$
- _____ 25. $@SUM(A1..A4) > 30 \# AND \# @SUM(B1..B4) > 30$

UNIT TEST--Lesson 10

Name: _____

Date: _____

MULTIPLE CHOICE

Answer the following by writing the letter of the best choice for each question in the space provided at the left of the question (5 pts. each):

- _____ 1. 1-2-3 functions always begin with the special character:
a. @
b. &
c. \$
d. #
- _____ 2. Numbers, cell or range references, or other functions that are the object of a 1-2-3 function name are called:
a. variables
b. nominatives
c. constants
d. arguments
- _____ 3. To perform calendar arithmetic, dates are represented as:
a. labels
b. serial numbers
c. variables
d. vowels
- _____ 4. Formulas that result in TRUE or FALSE values are called:
a. arithmetic functions
b. trigonometric functions
c. logical functions
d. statistical functions
- _____ 5. If a statement is TRUE, it has the numeric value of _____.
If a statment is FALSE, it has the numeric value of _____.
a. 1, 0
b. 0, 1
c. 1, 1
d. 0, 0

UNIT TEST--Lesson 10 Continued

MATCHING

Match the function with the appropriate definition by writing the letter for the function in the blank to the left of the definition (5 pts. each):

- | | |
|--|-------------|
| _____ 6. Returns the integer portion of a value | a. @PAYMENT |
| _____ 7. Returns the sum of values of cells in a list | b. @RND |
| _____ 8. Returns the number of items in a list | c. @TOTAL |
| _____ 9. Returns the maximum value of the entries in a list | d. @AVERAGE |
| _____ 10. Calculates the loan payment | e. @MIN |
| _____ 11. Rounds a number to a specified number of places | f. @MAX |
| _____ 12. Returns the average of all items in a list | g. @SUM |
| _____ 13. Logical function to check for an error value | h. @AVG |
| _____ 14. Logical function that makes a selection based on the value of a logical expression | i. @ROUND |
| | j. @COUNT |
| | k. @PMT |
| | l. @INT |
| | m. @ERR |
| | n. @IF |
| | o. @ISERR |

SHORT ANSWER

Complete the following questions about calendar arithmetic (5 pts each):

15. What is the serial number of the date, Jan. 31, 1900? _____
16. What is the result of the calculation, @DATE(86,6,29) - @DATE(86,6,14)? _____
17. What is the result of the calculation, @YEAR(@DATE(85,7,31) - @DATE(63,7,10))? _____
18. What is the result of the function, @MONTH(@DATE(12,11,10))? _____
19. What is the result of the function, @DAY(@DATE(12,11,10))? _____
20. What is the result of the calculation, @ROUND(0,(@DATE(86,6,26) - @DATE(86,6,6))/7)? _____

UNIT TEST--Lesson 11

Name: _____

Date: _____

SHORT ANSWER

From the command menu below, write the command to perform the following operations (6 pts. each):

```
Worksheet Range Copy Move File Print Graph Data System Quit
|
Global Insert Delete Column Erase Titles Window Status PageBreak
|           |           |           |           |
Column Row Column Row Yes No
|           |           |           |
Set-Width Reset-Width Hide Display
|
Format Label-Prefix Column-Width Recalculation Protection Default Zero
|           |
Left Right Center
|
Fixed Scientific Currency , General +/- Percent Date Text Hidden
|
Time
```

Example: Set global column width to 10: /WGC10

- (1) Format the whole worksheet so all numbers are displayed with a fixed number of two decimal places: _____
- (2) Insert a row at the pointer position: _____
- (3) Format the whole worksheet so all labels are centered: _____
- (4) Delete a column at the pointer position: _____
- (5) Erase the whole worksheet from the work area: _____
- (6) Set the column width to 12 on the column where the pointer is located: _____

UNIT TEST--Lesson 11 Continued

SHORT ANSWER

From the command menu below, write the command to perform the following operations (6 pts. each):

Worksheet Range Copy Move File Print Graph Data System Quit

Format Label Erase Name Justify Protect Unprotect Input Value Transpose

Left Right Center

Fixed Scientific Currency , General +/- Percent Date Text Hidden

Time

Example: Format the range A5..A10 to a fixed number of two decimal places: /RFF2A5..A10

(7) Format the range A2..E3 so all labels are right-aligned:

(8) Format the range C5..C16 so all serial numbers are displayed with date format number one: _____

(9) Erase the range C10..C5: _____

(10) Format the range D4..D18 so all numbers are displayed with commas between thousands and two decimal places: _____

UNIT TEST--Lesson 11 Continued

MATCHING

Match the format option with the appropriate definition by writing the letter for the format option in the blank at the left of the definition (5 pts. each):

- | | | |
|-----------|---|---------------|
| _____ 11. | Displays a date value of the serial number in one of five formats | a. Fixed |
| _____ 12. | Fixed number of decimal places | b. Scientific |
| _____ 13. | The value times 100 and a specified number of decimal places followed by a % sign | c. , (comma) |
| _____ 14. | Floating dollar signs before each entry, commas between thousands, negatives in parentheses, and fixed number of decimal places | d. General |
| _____ 15. | Commas between thousands, negatives in parentheses, and fixed number of decimal places | e. +/- |
| _____ 16. | Zeros to the right of the decimal are suppressed | f. Percent |
| _____ 17. | Displays a time value of the serial number in one of four formats | g. Date |
| _____ 18. | The contents do not appear on the screen although they still exist | h. Time |
| | | i. Text |
| | | j. Hidden |
| | | k. Currency |

UNIT TESTS (01 - 03)

GETTING STARTED WITH LOTUS 1-2-3--LESSON 01

Multiple Choice

1. d
2. c
3. b
4. e
5. d
6. d
7. d
8. b
9. a
10. d

Completion

11. A. Place System Disk in Drive A and
and practice disk in Drive B
B. Type LOTUS at A>
12. A. Place System Disk in Drive A and
and practice disk in Drive B
B. Type 123 at A>
13. A. Place DOS disk in Drive A and
practice disk in Drive B
B. Powner on the computer
C. Enter the Date and Time
D. Remove DOS disk and replace with
Lotus System Disk
E. Type LOTUS or 123 at A>

MOVING AROUND THE WORKSHEET--LESSON 02

Multiple Choice

1. a
2. c
3. b
4. e
5. c

Matching

6. i
7. k,m
8. c
9. h
10. a
11. g
12. d
13. j,l
14. e
15. f

TYPING CELL ENTRIES--LESSON 03

Multiple Choice

1. b
2. d
3. d
4. e
5. d

True or False

6. False
7. True
8. False
9. True

Identification

10. VALUE
11. LABEL
12. VALUE
13. LABEL
14. VALUE
15. VALUE
16. VALUE
17. VALUE
18. VALUE
19. LABEL

UNIT TESTS (04 - 07)

USING 1-2-3 COMMANDS--LESSON 04

Multiple Choice True or False

- | | |
|-------|-----------|
| 1. a. | 4. True |
| 2. c. | 5. False |
| 3. b. | 6. False |
| | 7. True |
| | 8. False |
| | 9. False |
| | 10. False |

INDICATING CELL RANGES-- LESSON 05

Multiple Choice True or False Matching

- | | | |
|------|----------|-------|
| 1. d | 5. True | 11. d |
| 2. c | 6. True | 12. f |
| 3. d | 7. False | 13. a |
| 4. b | 8. True | 14. b |
| | 9. True | 15. e |
| | 10. True | 16. c |

BUILDING A SIMPLE WORKSHEET--LESSON 06

True or False

- | | |
|------|-------|
| 1. T | 6. T |
| 2. F | 7. F |
| 3. T | 8. T |
| 4. T | 9. T |
| 5. F | 10. T |

BUILDING A SIMPLE DATABASE--LESSON 07

Multiple Choice Identification

- | | |
|------|---|
| 1. b | 9a. Social Security Number or Employee Number |
| 2. a | 9b. Name, Employee Name, or First/Last Name |
| 3. c | 9c. Wage, Hourly Wage, or Rate of Pay |
| 4. b | 9d. Hours, Hours Worked, or Regular Hours |
| 5. d | |
| 6. a | |
| 7. b | |
| 8. a | |

LOTUS 1-2-3 ANSWER KEY 2

UNIT TESTS (08 - 10)

BUILDING A SIMPLE GRAPH--LESSON 08

Matching	Multiple Choice
1. e	6. c
2. c	7. d
3. d	8. b
4. a	9. b
5. b	10. a

WRITING FORMULAS--LESSON 09

True or False	Matching	Short Answer	Identification
1. False	9. d	15. $+A1+A2+A3+A4$	21. TRUE
2. True	10. b	18	22. FALSE
3. True	11. e	16. $+A1+B1+C1+D1$	23. TRUE
4. False	12. g	20	24. TRUE
5. False	13. c	17. $(A1+A2+A3+A4)/4$	25. FALSE
6. True	14. i	4.5	
7. True		18. $+D1^2+D2^2+D3^2+D4^2$	
8. False		110	
		19. $(A2+B2)*C2-D2$	
		21	
		20. $(C1+C2+C3+C4)-(B1+B2+B3+B4)$	
		7	

1-2-3 FUNCTIONS--LESSON 10

Multiple Choice	Matching	Short Answer
1. a	6. l	15. 31
2. d	7. g	16. 15
3. b	8. j	17. 22
4. c	9. f	18. 11
5. a	10. k	19. 10
	11. i	20. 3
	12. h	
	13. o	
	14. n	

UNIT TESTS (11 - 11)

FORMATTING A WORKSHEET--LESSON 11

<u>Short Answer</u>	<u>Matching</u>
1. /WGFF2	11. g
2. /WIR	12. a
3. /WGLC	13. f
4. /WDC	14. k
5. /WEY	15. c
6. /WCS12	16. d
7. /RLRA2..E3	17. h
8. /RFD1C5..C16	18. j
9. /REC10..C5	
10. /RF,2D4..D18	

EXERCISES (01 - 02)

GETTING STARTED WITH LOTUS 1-2-3--LESSON 01

1. Visicalc -- Apple
2. Columns and Rows
3. Release 1A -- 256 columns x 2048 rows
Release 2 -- 256 columns x 8192 rows
4.
 - a. Cell--the intersection of a row and column
 - b. Pointer--highlighted rectangle indicating the cell at which data is to be entered
 - c. Active Cell--the cell on which the pointer rests
 - d. Window--that part of the worksheet which is displayed on the screen at any given moment
5.
 - a. Place a DOS disk in Drive A and practice disk in B.
 - b. Power on the computer.
 - c. Enter the date and time.
 - d. Remove DOS disk in Drive A and replace with Lotus System Disk.
 - e. Type LOTUS to enter the Access System.
6.
 - a. Power on the computer.
 - b. Enter the Date and Time.
 - c. Change the default directory to the Lotus sub-directory.
 - d. Place the Lotus System Disk in Drive A.
 - e. Type LOTUS to enter the Access System.
7.
 - a. Power on the computer.
 - b. Enter the Date and Time.
 - c. Place your practice diskette in Drive A.
 - d. Select the option for Lotus 1-2-3 from the hard disk menu program.

MOVING AROUND THE WORKSHEET--LESSON 02

1. The cursor movement keys located on the numeric keypad.
2. Auto-repeat
3. Columns A and H and Rows 1 and 20.
4.
 - a. Right Arrow--moves the pointer one cell to the right.
 - b. Left Arrow--moves the pointer one cell to the left.
 - c. Up Arrow--moves the pointer one cell upward.
 - d. Down Arrow--moves the pointer one cell downward.
 - e. GoTo--moves the pointer to a specified cell.
 - f. Home--moves the pointer to cell A1.
 - g. PgUp--moves the pointer one screen upward.
 - h. PgDn--moves the pointer one screen downward.
 - i. Scroll Lock--locks the scrolling feature on and off.
 - j. Num Lock--locks the numeric keypad on and off.
 - k. Tab Right--moves the pointer one screen to the right.
 - l. Tab Left--moves the pointer one screen to the left.
 - m. Ctrl Right Arrow--moves the pointer one screen to the right.
 - n. Ctrl Left Arrow--moves the pointer one screen to the left.

LOTUS 1-2-3 ANSWER KEY 5

EXERCISES (02 - 04)

MOVING AROUND THE WORKSHEET--LESSON 02 cont.

OPERATION 1: Cell D4
OPERATION 2: Cell I41
OPERATION 3: Cell J7
OPERATION 4: Cell L35

TYPING CELL ENTRIES--LESSON 03

1.
 - a. Displays current cell address, format, and contents
 - b. Displays characters being entered or edited
 - c. Displays explanations of menu item highlighted by pointer
2.
 - a. Numbers
 - b. Formulas
 - c. Labels
3.
 - a. A number may begin with a digit, plus or minus sign, a period or \$.
 - b. A number may end with % sign to indicate percent.
 - c. A number may have no more than one decimal point.
 - d. You may not use commas or spaces when entering a number.
 - e. You may end a number with a power-of-ten scaling factor.
4.
 - a. Apostrophe--left aligns an entry in a cell
 - b. Quotation Marks--right aligns an entry in a cell
 - c. Caret--centers an entry in a cell
 - d. Backslash--repeats a label in a cell
5.
 - a. Left Arrow--move cursor one character to the left
 - b. Right Arrow--move cursor one character to the right
 - c. Tab Left--move cursor 5 characters to the left
 - d. Tab Right--move cursor 5 characters to the right
 - e. Home--move cursor to first character of entry
 - f. End--move cursor to last character of entry
 - g. Del--delete character at the cursor
 - h. Backspace--delete character preceding the cursor

USING 1-2-3 COMMANDS--LESSON 04

1.
 - a. Copying, moving, deleting, and formatting
 - b. Transferring data between the worksheet and disk storage
 - c. Printing reports
 - d. Drawing graphs
 - e. Handling databases
2.
 - a. Pointing
 - b. Typing
 - c. Typing

EXERCISES (05 - 05)

INDICATING CELL RANGES--LESSON 05

- (1) RANGE A: A2..C5
- (2) RANGE B: D4..F7
- (3) RANGE C: D19..B15
- (4) RANGE D: H17..G20
- (5) RANGE E: A12..C10

	A	B	C	D	E	F	G	H
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

6.
 - a. Cell to which the expanded pointer is anchored.
 - b. Cell diagonally opposite the anchor cell of the expanded cell pointer.
7.
 - a. Anchors one corner of the cell pointer.
 - b. Moves the anchor to the next corner of the expanded cell pointer.
8.
 - a. Returns to the previous command step.
 - b. Shrinks the expanded pointer to cover only the anchored cell and removes the anchor.
9.
 - a. Cancels the range specification and returns the cell pointer to the current cell.
 - b. Cancels the range specification and returns the cell pointer to the current cell.

LOTUS 1-2-3 ANSWER KEY 7

EXERCISES (06-08)

BUILDING A SIMPLE WORKSHEET--LESSON 06

Instructor should check to see that the worksheet contains totals for the following cells:

Worksheet Totals and Formulas:

B11:	2700	@SUM(B6..B9)	
C11:	2600	@SUM(C6..C9)	
D11:	3100	@SUM(D6..D9)	
E11:	2900	@SUM(E6..E9)	
F11:	11300	@SUM(F6..F9)	or @SUM(B11..E11)
G11:	99.99923	@SUM(G6..G9)	
F6:	4800	@SUM(B6..E6)	
F7:	1600	@SUM(B7..E7)	
F8:	500	@SUM(B8..E8)	
F9:	4400	@SUM(B9..E9)	
G6:	42.4778	+F6/F11*100	
G7:	14.159292	+F7/F11*100	
G8:	4.424778	+F8/F11*100	
G9:	38.938053	+F9/F11*100	

BUILDING A SIMPLE DATABASE--LESSON 07

Instructor should check to see that the worksheet is printed in sorted order by Instructor, next by Department, next by Room Number and Time.

BUILDING A SIMPLE GRAPH--LESSON 08

Instructor should check to see that a pie chart is printed with 4 wedges that are shaded and labeled A, B, C, and D. The graph should have the title, PERCENTAGE OF SALES BY PRODUCT--1985.

Instructor should check to see that a bar graph is printed with 4 bars that are labeled A, B, C, and D. The X axis should be labels PRODUCT and the Y axis should be labeled PERCENTAGE OF SALES. The graph should have the title, PERCENTAGE OF SALES BY PRODUCT--1985.

EXERCISES (09 - 09)

WRITING FORMULAS--LESSON 09

- (1)
 - a. Formula--an instruction for 1-2-3 to calculate a number
 - b. Referenced Cell--cell whose values are used in the formula
 - c. Relative--a positional relationship between cells
 - d. Absolute Cell Address--a cell address which when referenced does not change
 - e. Precedence--order of operations
- (2)
 - a. ^ (exponentiation)
 - b. - + (negative and positive)
 - c. * / (multiplication and division)
 - d. + - (addition and subtraction)
- (3)
 - a. 3.33
 - b. -1
 - c. 4
 - d. 7
 - e. 45
 - f. -10
 - g. 0 (FALSE)
 - h. 1 (TRUE)
- (4) Unless parentheses are used to override, take the negative is performed before multiply and divide, which are performed before add and subtract.
- (5) Operations with higher precedence are performed first unless overridden by parentheses. Operations of equal precedence are performed from left to right.

OPERATION 1: 212326

OPERATION 2: D2 - 11.25
D3 - 15.75
D4 - 34.05
D5 - 29.85

OPERATION 3: F2 - 1
F3 - 0
F4 - 1

CASE STUDY: ANNUITY CONTRIBUTION WORKSHEET

ANNUITY

Annuity Contribution Worksheet
Rate 0.12

Employee Name	Gross Pay	Annuity Amount	Net Pay
Jones, J.	250	30	220
Brown, C.	280	33.6	246.4
Smith, N.	150	18	132
Green, A.	200	24	176
King, B.	400	48	352
TOTALS	1280	153.6	1127.4

- 1. +\$B\$2*B7 or +B7*\$B&2
2. +B7-C7
3. +B7+B8+B9+B10+B11

ANNUITY

Annuity Contribution Worksheet
Rate 0.12

Employee Name	Gross Pay	Annuity Amount	Net Pay	Over 2000
Jones, J.	250	30	220	0
Brown, C.	280	33.6	246.4	0
Smith, N.	150	18	132	0
Green, A.	200	24	176	0
King, B.	400	48	352	1
TOTALS	1280	153.6	1127.4	

- 4. +C7*52>2000
King, B.

CASE STUDY: SOFTRIGHT SOFTWARE SALES

SOFTRIGHT

SOFTRIGHT SOFTWARE SALES

	Area 1	Area 2	Area 3	Area 4
Sales of SoftBase (units)	1200	380	450	1400
Selling Price of SoftBase	395	395	395	395
Revenue from SoftBase	474000	150100	177750	553000
Sales of SoftWord (units)	1100	380	800	400
Selling Price of SoftWord	295	295	295	295
Revenue from SoftWord	324500	112100	236000	118000
Total Sales Revenue	798500	262200	413750	671000
Sales Commission	17955	1866	6412.5	14130

SOFTRIGHT

SOFTRIGHT SOFTWARE SALES

	Area 1	Area 2	Area 3	Area 4
Sales of SoftBase (units)	750	600	900	1100
Selling Price of SoftBase	395	395	395	395
Revenue from SoftBase	296250	237000	355500	434500
Sales of SoftWord (units)	800	210	900	1800
Selling Price of SoftWord	295	295	295	295
Revenue from SoftWord	236000	61950	265500	531000
Total Sales Revenue	532250	298950	621000	965500
Sales Commission	9967.5	2968.5	12630	22965

EXERCISES (10-10)

1-2-3 FUNCTIONS--LESSON 10

COMPTON

Mrs. Compton's Computer Class

Student	Grade 1	Grade 2	Grade 3	Grade 4	Average
B.Brown	80	75	75	90	80
E.Evans	90	85	88	85	87
G.Green	62	73	91	74	75
S.Smith	98	93	76	97	91
T.Taylor	100	87	91	94	93
W.White	80	73	65	82	75
Averages	85	81	81	87	83.5

PAYMENT

Loan Payment Worksheet

Principal Amount: 5000
Interest Rate: 0.12
Number of Years: 5

Payment Amount: 111.2222

INVOICE

ABC Computer Supplies Co.

Outstanding Invoices Report 15-Jul-86

Invoice Number	Customer Number	Invoice Amount	Date Due	Days Due
12466-A	40510	256.89	24-May-86	52
13987-C	20876	78.75	25-Feb-86	140
26945-B	19872	113.49	01-Apr-86	105
27201-C	83904	13.24	03-Jun-86	42
35443-C	39210	98.43	10-May-86	66
43223-B	83842	289.93	14-Jun-86	31
57983-A	92844	36.35	15-Apr-86	91
58876-B	12938	119.95	19-Jun-86	26
63211-A	93874	20.55	03-Jul-86	12
66295-B	76465	308.95	12-Jul-86	3

Total Amount Due: 1336.53
Average Days Due: 56.8

LOTUS 1-2-3 ANSWER KEY 12

EXERCISES (10-10 cont.)

ARAGING

ABC Computer Supplies Co.
A/R Aging Report 15-Jul-86

Invoice Number	Invoice Amount	Date Due	Current	Over 30 Days	Over 60 Days	Over 90 Days
12466-A	256.89	24-May-86		256.89		
13987-C	78.75	25-Feb-86				78.75
26945-B	113.49	01-Apr-86				113.49
27201-C	13.24	03-Jun-86		13.24		
35443-C	98.43	10-May-86			98.43	
43223-B	289.93	14-Jun-86		289.93		
57983-A	36.35	15-Apr-86				36.35
58876-B	119.95	19-Jun-86	119.95			
63211-A	20.55	03-Jul-86	20.55			
66295-B	308.95	12-Jul-86	308.95			
Totals	1336.53		449.45	560.06	98.43	228.59

EXERCISES (11-11)

FORMATTING A WORKSHEET--LESSON 11

INCOME

FLANAGAN PAPER COMPANY INCOME STATEMENT FOR PERIOD ENDING 10/31/85

REVENUE

Sales	23,048.30
Sales Discount	(276.48)
Sales Returns and Allowance	(28.00)

TOTAL REVENUE	22,743.82

COST OF GOODS SOLD

Beginning Inventory	35,000.00
Purchases	25,522.00
Purchases Discount	(403.07)
Purchases Returns and Allowance	(86.40)
Less Ending Inventory	(50,000.00)

COST OF GOODS SOLD	10,032.53

GROSS PROFIT

12,711.29

EXPENSES

Advertising Expense	562.90
Insurance Expense	250.00
Depreciation Expense	1,000.00
Office Supplies Expense	186.00
Legal and Professional Fees	279.00

TOTAL EXPENSES

2,277.90

NET INCOME FROM OPERATIONS

10,433.39

=====

EXERCISES (11-11 cont.)

BALANCE

FLANAGAN PAPER COMPANY
BALANCE SHEET
AS OF 10/31/85

ASSETS

Cash	16,050.20	
Accounts Receivable	9,560.31	
Merchandise Inventory	50,000.00	
Store Supplies	280.00	
Prepaid Insurance	1486.20	
Store Equipment	12272.00	
Accum. Deprec.--Store Equipment	(4,900.00)	
Office Equipment	3,200.00	
Accum. Deprec.--Office Equipment	(1,330.00)	
Building	60,000.00	
Accum. Deprec.--Building	(7,150.00)	
Land	10,000.00	

TOTAL ASSETS		149,468.71
		=====

LIABILITIES

Accounts Payable	8,314.30	
Sales Tax Payable	823.17	
Mortgage Note Payable	14,300.00	

TOTAL LIABILITIES		23,437.47

CAPITAL

Sally Flanagan, Capital	126,031.24	

TOTAL CAPITAL		126,031.24

LIABILITIES AND CAPITAL		149,468.71
		=====

EXERCISES (11-11 cont.)

BUDGET

FLANAGAN PAPER COMPANY
BUDGET INCOME STATEMENT
FOR PERIOD ENDING 10/31/85

REVENUE	Actual	Budget	Dollar Variance	Percent Variance
Sales	23,048.30	20,000.00	3048.30	15%
Sales Discount	(276.48)		-276.48	0%
Sales Returns and Allowance	(28.00)		-28.00	0%
TOTAL REVENUE	22,743.82	20,000.00	2743.82	14%
COST OF GOODS SOLD				
Beginning Inventory	35,000.00	35,000.00	0.00	0%
Purchases	25,522.00	20,000.00	5522.00	28%
Purchases Discount	(403.07)		-403.07	0%
Purchases Returns and Allowance	(86.40)		-86.40	0%
Less Ending Inventory	(50,000.00)	(50,000.00)	0.00	0%
COST OF GOODS SOLD	10,032.53	5,000.00	5032.53	101%
GROSS PROFIT	12,711.29	15,000.00	-2288.71	-15%
EXPENSES				
Advertising Expense	562.90	500.00	62.90	13%
Insurance Expense	250.00	250.00	0.00	0%
Depreciation Expense	1,000.00	1,200.00	-200.00	-17%
Store Supplies Expense	186.00	200.00	-14.00	-7%
Legal & Prof. Fees Ex.	279.00	200.00	-21.00	-11%
TOTAL EXPENSES	2,277.90	2,350.00	-72.10	-3%
NET INCOME FROM OPERATIONS	10,433.39	12,650.00	-2216.61	-18%